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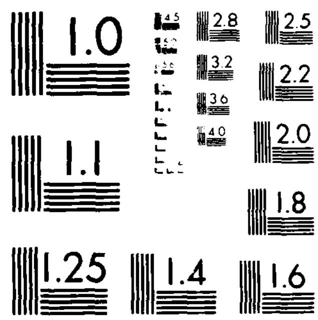

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

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AD-A195 363

INSTALLATION RESTORATION PROGRAM

Phase I
Records Search

125th Fighter Interceptor Group
Florida Air National Guard
Jacksonville International Airport
Jacksonville, Florida

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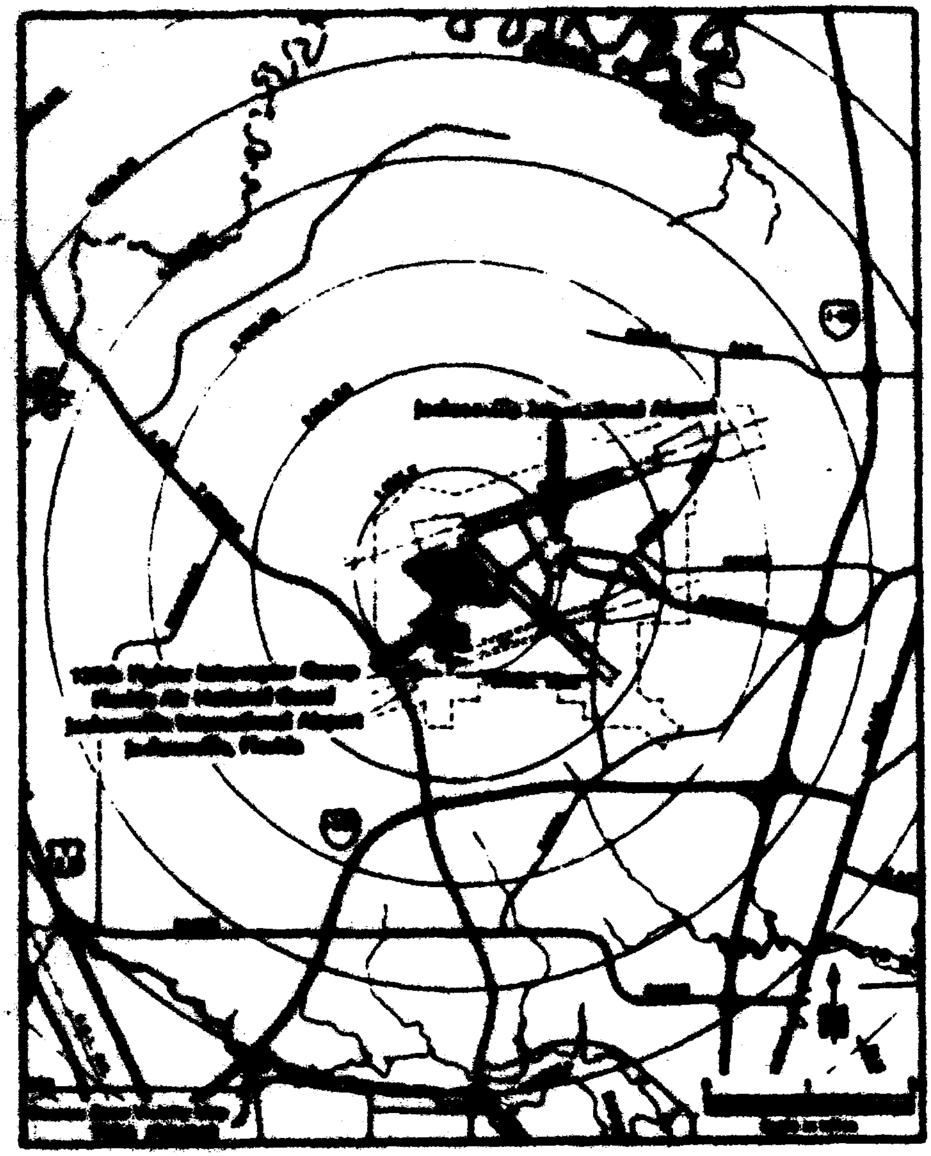

This report has been prepared for the National Guard Bureau, Washington, DC, by the Hazardous Materials Technical Center for the purpose of aiding in the implementation of the Air Force Installation Restoration Program.

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INSTALLATION RESTORATION PROGRAM

PHASE I - RECORDS SEARCH

125th FIGHTER INTERCEPTOR GROUP

FLORIDA AIR NATIONAL GUARD

JACKSONVILLE INTERNATIONAL AIRPORT

JACKSONVILLE, FLORIDA

ERRATA SHEET NO. 1 (31 August 1987)

The following corrections should be made to basic document.

Page No.	
ES-	7th Line Change 16 Base employees to "17 Base employees".
ES-	1st line Change 16 installation personnel to "17 installation personnel".
IV-	Section B, 1st line Change 16 Base personnel to "17 installation personnel".
VI-	1st line Change 16 Base personnel to "17 Base personnel".

INSTALLATION RESTORATION PROGRAM
PHASE I - RECORDS SEARCH FOR

125th FIGHTER INTERCEPTOR GROUP
FLORIDA AIR NATIONAL GUARD
JACKSONVILLE INTERNATIONAL AIRPORT
JACKSONVILLE, FLORIDA

July 1987

Prepared for

National Guard Bureau
Washington, DC 20310

Prepared by

Hazardous Materials Technical Center
The Dynamac Building
11140 Rockville Pike
Rockville, MD 20852

Contract No. DLA 900-82-C-4426

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EXECUTIVE SUMMARY

A. INTRODUCTION

The Hazardous Materials Technical Center (HMTC) was retained in June 1986 to conduct The Installation Restoration Program (IRP) Phase I Records Search of the 125th Fighter Intercepter Group (FIG), Florida Air National Guard (ANG), Jacksonville International Airport (JIAP), Jacksonville, Florida (hereinafter referred to as the Base), under Contract No. DLA 900-82-C-4426 (Records Search). The Records Search included

- an onsite visit including interviews with 16 Base employees conducted by HMTC personnel during 24-26 June 1986;
- the acquisition and analysis of pertinent information and records on hazardous materials use and hazardous waste generation and disposal at the Base;
- the acquisition and analysis of available geologic, hydrologic, meteorologic, and environmental data from pertinent Federal, State, and local agencies; and
- the identification of sites on the Base which may be potentially contaminated with hazardous materials.

B. MAJOR FINDINGS

The major operations of the 125th FIG that have used and disposed of hazardou materials/wastes include aircraft maintenance; aerospace ground equipment (AGE) maintenance, ground vehicle maintenance; and petroleum, oil, and lubricant (POL) management and distribution; and air weapons control. The operations involve such activities as corrosion control, nondestructive inspection (NDI), fuel cell maintenance, engine maintenance, and pneudraulics, structural repair, missile maintenance and wheel and tire maintenance. Waste oils, recovered fuels, paint wastes, spent cleaners, acids, strippers, and solvents were generated and disposed of by these activities.

Interviews with 16 installation personnel and a field survey resulted in the identification of seven disposal and/or spill sites at the Base. Each of the seven sites are potentially contaminated with hazardous materials resulting from Air National Guard (ANG) operations. The following are the identified sites:

Site No. 1 - OWS Inlets Along Aircraft Parking Apron
Site No. 2 - Subsurface of Aircraft Parking Apron
Site No. 3 - Fire Training Area
Site No. 4 - OWS at the Hush House (Building 25)
Site No. 5 - OWS at Vehicle Maintenance Building (Building No. 7)
Site No. 6 - Area Outside the Munitions Building
Site No. 7 - Trim Pad for Aircraft Run-up

Environmental stress or visual evidence of contamination is present at Site Nos. 1, 3, 4, 5, and 7. At Site No. 4, there are indications of contaminant migration offsite through surface water. Site Nos. 1, 3, 4, and 7 were assigned a hazard assessment score (HAS) utilizing the Air Force Hazard Assessment Rating Methodology (HARM).

Site Nos. 2, 5, and 6 were not scored under HARM. Although direct evidence indicates that Site No. 2 (Subsurface of Aircraft Parking Apron) is contaminated with jet fuel, this site was not scored using HARM because sufficient information concerning the hazardous materials involved (i.e., type, quantity, and source) could not be determined to effectively evaluate the site. Site Nos. 5 and 6 were not scored because contamination remaining at these sites is considered minor and not susceptible to migration.

C. CONCLUSIONS

Four of the identified potentially contaminated hazardous waste sites are considered to have the potential for contaminant migration; and therefore, have been further evaluated and given a HAS utilizing HARM.

Site No. 1 - OWS Inlets Along Aircraft Parking Apron (HAS-71)

Malfunctioning storm drainage inlets allow contaminated run-off from the aircraft parking apron, which is normally channelled to an oil/water separator (OWS), to flow onto the ground around the OWS inlets at this site.

Site No. 3 - Fire Training Area (HAS-73)

This site is consists of three areas used from 1968 to 1984 for fire training exercises. These areas were unlined and had no containment structures. Several drums of JP-4 and other flammables were burned during each fire training exercise. It is estimated that a total of 12,800 gallons of hazardous waste was released at these three areas, assuming that fire training exercises were held four times per year over a 16-year period. If 70 percent of the flammables were destroyed by fire, approximately 4,000 gallons may have remained to evaporate, seep into the soil, or run off into surface drainage.

Site No. 4 - OWS at the Hush House (Building 25) (HAS-68)

An OWS at the Hush House is malfunctioning and releasing POL products into a nearby surface stream.

Site No. 7 - Trim Pad for Aircraft Run-Up (HAS-77)

JP-4 originating from engine run-up activities frequently spills on the ground at this site and is washed to the edges of the trim pad.

Because of the potential for surface water and groundwater contamination and the possibility of contaminant migration, these sites should be further investigated in accordance with the IRP Phase II/IVA process.

D. RECOMMENDATIONS

Because of the potential for contaminant migration, initial investigative stages of the IRP Phase II/IVA are recommended for the five sites (includes Site No. 2, an unrated site) that are potentially contaminated with hazardous materials resulting from ANG operations. The primary purposes of the subsequent investigations are listed as follows:

1. To determine if pollutants are present at each site or determine that no pollutants are present; and

2. To determine whether groundwater or surface water at each site has been contaminated, and if it has, give quantification with respect to contaminant concentrations, the boundary of the contaminant plume, and the rate of contaminant migration.

All of the potentially contaminated sites where follow-up IRP recommendations have been made (Site Nos. 1, 2, 3, 4, and 7) involve solvents and/or POL products. Soil and water samples recommended at these sites should be analyzed for petroleum hydrocarbons, halogenated and aromatic organics, and total organic carbon. Additionally, at Site No. 2, it is recommended that appropriate geophysical/geochemical sampling techniques be implemented to aid in identifying the extent of contamination at this site with minimal disturbance of parking apron concrete. Particular attention should be given to subsurface manmade structures, such as drainage pipes running under the parking ramp, that may be acting as contaminant transport pathways.

I. INTRODUCTION

A. Background

The 125th Fighter Interceptor Group (FIG) is located at Jacksonville International Airport (JIAP), Jacksonville, Florida (hereinafter referred to as the Base). The Base has been active since 1968, and over the years the types of military aircraft based and serviced there have varied. Both past and present operations have involved the use of hazardous materials and disposal of hazardous wastes. Because of the use of hazardous materials and disposal of hazardous wastes, the National Guard Bureau (NGB) has implemented its Installation Restoration Program (IRP). The IRP is a four-phase program consisting of the following:

Phase I - Records Search (Installation Assessment) - to identify past spill or disposal sites posing a potential and/or actual hazard to public health or the environment.

Phase II/IVA - Site Characterization/Remedial Action Plan - acquiring data via field studies, for the confirmation and quantification of environmental contamination that may have an adverse impact on public health or the environment; preparing a Remedial Action Plan (RAP), and if directed by the National Guard Bureau, preparing designs and specifications.

Phase III - Technology Base Development (if needed) - developing new technology for accomplishment of remediation.

Phase IVB - Implementation of Site Remedial Action.

B. Purpose

The purpose of this IRP Phase I - Records Search (hereafter referred to as Records Search) is to identify and evaluate suspected problems associated with past hazardous waste handling procedures, disposal sites, and spill sites on the Base. The potential for migration of hazardous contaminants is evaluated

by visiting the Base, reviewing existing environmental information, analyzing Base records concerning the use and generation of hazardous material/hazardous wastes, and conducting interviews with past and present Base personnel who are familiar with past hazardous material management activities. Relevant information collected and analyzed as a part of the Records Search included the history of the Base, with special emphasis on the history of the shop operations and their past hazardous materials/hazardous waste management procedures; the local geological, hydrological, and meteorological conditions that may affect migration of contaminants; local land use, public utilities, and zoning requirements that affect the potentiality for exposure to contaminants, and the ecological settings that indicate environmentally sensitive habitats or evidence of environmental stress.

C. Scope

The scope of this Records Search is limited to spills, leaks, or disposal procedures on the Base or on property for which the Air National Guard was the sole user, and includes:

- o An onsite visit;
- o The acquisition of pertinent information and records on hazardous materials use and hazardous waste generation and disposal practices at the Base;
- o The acquisition of available geologic, hydrologic, meteorologic, land use and zoning, critical habitat, and utility data from various Federal, Florida State, and local agencies;
- o A review and analysis of all information obtained; and
- o The preparation of a report, to include recommendations for further actions.

The onsite visit and interviews with past and present personnel were conducted during the period 24-27 June 1986. The HMTC Records Search effort was conducted by the following individuals:

- o Mr. Timothy Gardner, Environmental Scientist (M.A., Environmental Biology, 1984);

- Mr. Donato Telesca, Project Manager/Chemical Engineer (B.S., Chemical Engineering, 1948);
- Mr. Eric Kuhl, Staff Scientist (B.A., Environmental Policy/Political Science, 1982).

Resumes are included as Appendix A.

Individuals from the ANG who assisted in the records search include Mr. Arthur Lee, Environmental Engineer, ANGSC/DEV; SMSgt. James L. Craig, Bioenvironmental Engineering Superintendent, ANGSC/SGB; Sgt. Pat Sellars, 125/CES and other selected members of the 125th FIG. The Point of Contact at the base was Captain William E. Norton, Base Civil Engineer.

D. Methodology

A flow chart of the IRP Phase I Records Search Methodology is presented in Figure 1. This Records Search Methodology, to the greatest extent possible, ensures a comprehensive collection and review of pertinent site specific information, and is utilized in the identification and assessment of potentially contaminated hazardous waste spill/disposal sites.

The Records Search began with a site visit to the Base to identify all shop operations or activities on the installation that may have utilized hazardous material or generated hazardous waste. Next, an evaluation of past and present hazardous material/hazardous waste handling procedures at the identified locations was made to determine whether environmental contamination may have occurred. The evaluation of past hazardous materials/hazardous waste handling practices was facilitated by extensive interviews with 16 past and present employees familiar with the various operating procedures at the installation. These interviews were also utilized to define the areas on the Base where any waste materials, either intentionally or inadvertently, may have been used, spilled, stored, disposed of, or released into the environment.

Appendix B lists the interviewee's principle areas of knowledge and their years of experience with the Base. Historical records contained in the Base's

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PHASE I
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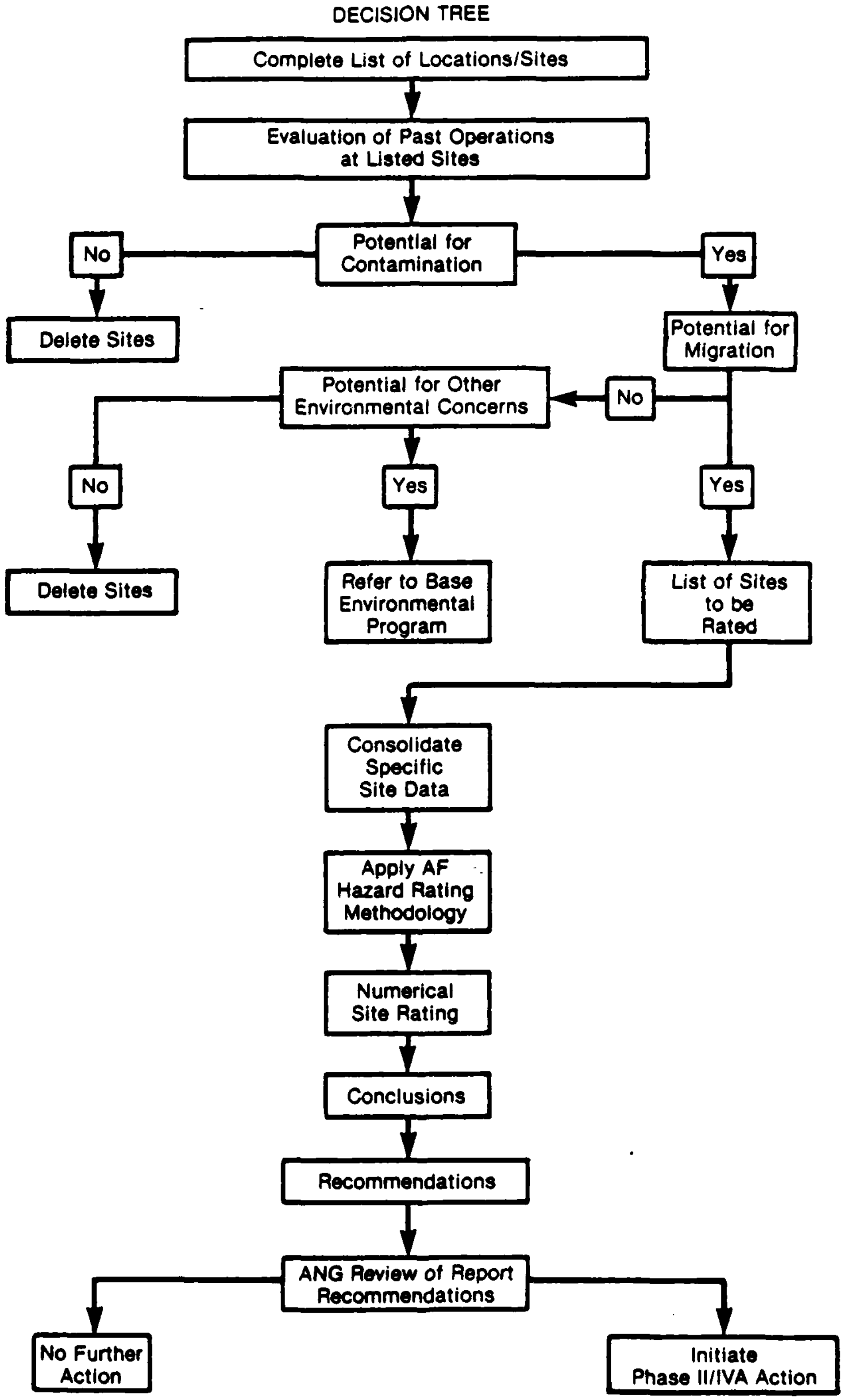
Figure 1.
Records Search Methodology Flow Chart.



files were collected and reviewed to supplement the information obtained from interviews. Using the information outlined above, a list of past waste spill/disposal sites on the Base was compiled for further evaluation. A general survey tour of the identified spill/disposal sites, the Base, and the surrounding area was conducted to determine the presence of visible contamination and to help assess the potential for contaminant migration. Particular attention was given to locating nearby drainage ditches, surface water bodies, residences, and wells.

Detailed geological, hydrological, meteorological, development (land use and zoning), and environmental data for the area of study was also obtained from appropriate Federal, State and local agencies as identified in Appendix C. Following a detailed analysis of all the information obtained, seven sites were identified as potentially contaminated with hazardous materials resulting from ANG operations. The potential for contaminant migration exists at five of these sites. Where sufficient information was available, sites were numerically scored utilizing the Air Force Hazard Assessment Rating Methodology (HARM). A description of HARM is presented in Appendix D. Copies of completed Hazardous Assessment Rating Forms are found in Appendix E. If sufficient information required by HARM (e.g., quantity of waste, hazardous material, components, persistence) could not be estimated through interviews and analysis of records, or if actual releases could not be confirmed, the sites were not scored. Recommendations for follow-up investigations were developed for the five sites exhibiting a potential for contaminant migration.

II. INSTALLATION DESCRIPTION

A. Location

The 125th FIG is located at the JIAP, approximately 10 miles north of the center of the city of Jacksonville, Florida, in Duval County. The Base occupies 332 acres in the western portion of the JIAP complex. Figure 2 displays the Air National Guard property studied for this Records Search.

B. Organization and History

The Florida ANG's 125th FIG moved to its current facilities at the JIAP in October, 1968. The Base facilities were constructed on undeveloped land concurrently with construction of the JIAP.

Aircraft of the 125th FIG are manned by combat ready aircrews around the clock. The 125th's primary mission is to provide quick response when unidentified aircraft appear on radar heading for United States borders. The first aircraft to be stationed at the Base was the F-102, specifically designed for the 125th FIG's air defense mission. In 1974, the 125th began an aircraft conversion; changing from the F-102 aircraft to the F-106 "Delta Dart," a sophisticated all weather supersonic aircraft. In support of the increased maintenance operation activities associated with the new F-106 aircraft, construction of several new airbase maintenance facilities were required and added to the installation.

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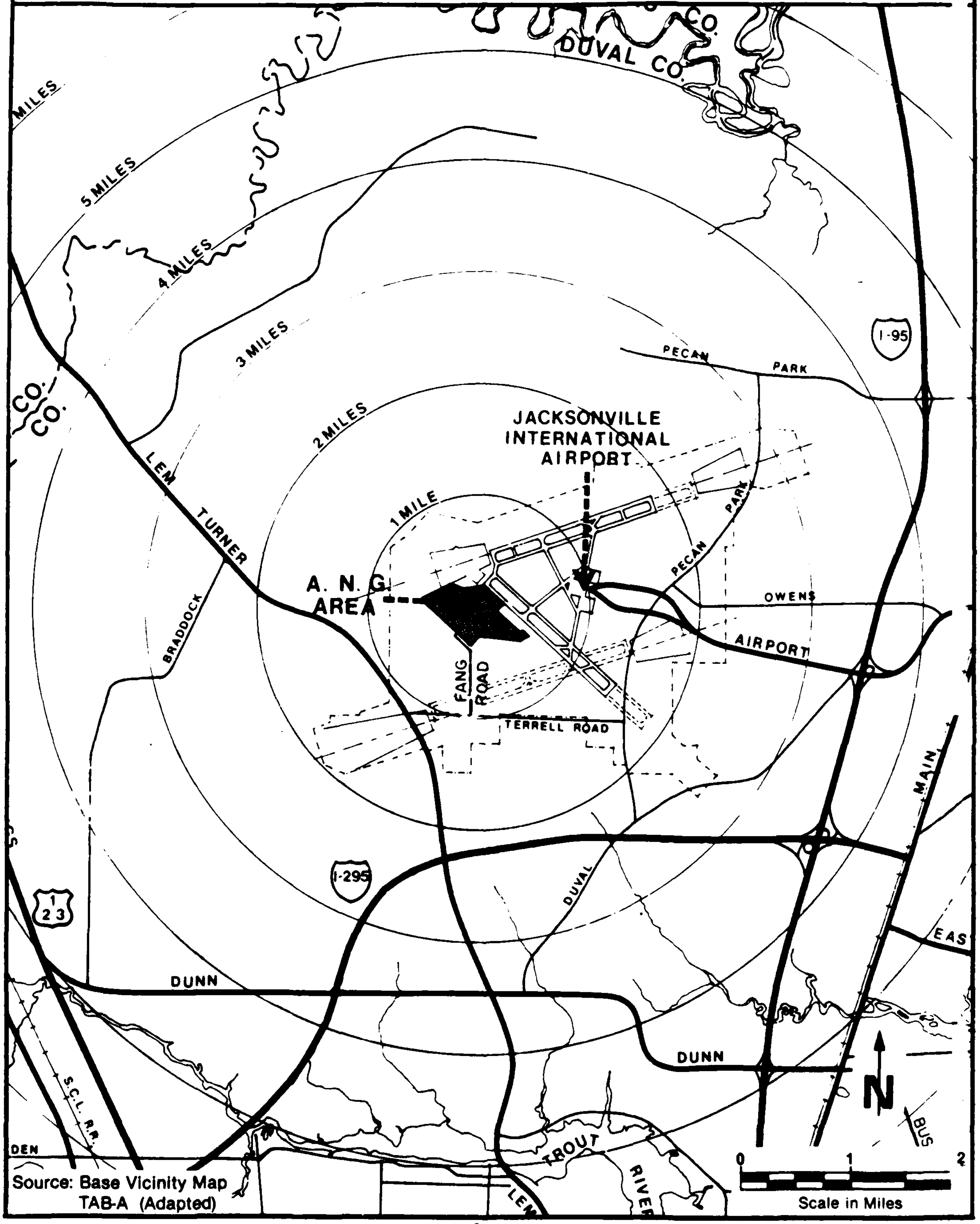
Figure 2.

Site Map of Florida Air National Guard, Jacksonville International Airport, Jacksonville, Florida.



Source: Base Vicinity Map TAB-A (Adapted)

III. ENVIRONMENTAL SETTING

A. Meteorology

Jacksonville has an annual average of 54.47 inches of rainfall. By calculating net precipitation according to the method outlined in the Federal Register (47 FR 31224, 16 July 1982), a net precipitation value of 8.47 inches per year is obtained. Rainfall intensity based on 1-year, 24-hour rainfall is 4 inches (calculated according to 47 FR 31235, 16 July 1982, Figure 8).

B. Geology

The city of Jacksonville is located north and east of the crest of the Ocala uplift. Underlying the city of Jacksonville, including the JIAP, are bedrock deposits of Eocene limestones covered by younger dolomite limestones and unconsolidated deposits of sands, clays, and shell beds (Scott, 1978).

The limestone stratum beneath the JIAP occurs within the Miocene Hawthorne Formation, and is encountered between 85 and 86 feet below the ground surface. The Hawthorne limestone lithology generally consists of a soft, friable, cavernous, sandy limestone ranging from 5 to 40 feet in thickness (Speechler, 1982).

Shelly and sandy clay geologic units, which overlie the limestone bedrock, are of Upper Miocene through Pleistocene age and represent ancient lagoonal and estuarine environments (Scott, 1978). Base soil borings show these unconsolidated deposits as ranging from loose, silty clayey sand, to firm, blue grey, silty, medium to fine sand, occurring immediately over the limestone formation (Reynolds et. al., 1972).

The soils at the 125th FIG are represented by two soil series - Urban land and Pelham fine sand. The following description of these soils is derived from the Soil Survey of the City of Jacksonville, Duval County, Florida (1978).

The soil type covering the majority of the Base is classified as Urban land. Such Urban land soils are made up of undifferentiated soil materials, for which precise chemical and physical properties are unavailable. The Urban land unit and other surrounding soils at the Base all fall under the general classification of Pelham-Mascotte-Sapelo soils. As a general soil unit, Pelham-Mascotte-Sapelo soils are described as nearly level, poorly drained soils, that are sandy to a depth of 20 inches or more, and loamy below.

Soils in the eastern portion of the Base (areas encompassing Site Nos. 5 and 6) have been discretely mapped by the U.S. Department of Agriculture as Pelham fine sand. This soil is a nearly level, poorly drained soil, with a very dark grey, loamy fine sand surface layer about 6 inches thick; a fine sand subsurface layer about 15 inches thick; and a sandy loam subsoil about 50 inches thick.

The permeability rate for the Pelham fine sand soil is between 4.2×10^{-4} cm/sec and 1.4×10^{-2} cm/sec. All soils surrounding the base for which data is available have permeability rates equivalent to the Pelham Fine sand. It is therefore assumed that soil permeability rates for the soils classified as Urban land are approximately equivalent to the Pelham soils, since these soils are made up of undifferentiated soils from surrounding soil types.

C. Hydrology

1. Surface Water

Flood data records reported by the Northeast Florida Regional Planning Council (see Appendix C) verify that the Base does not lie within the boundaries of a flood plain associated with 100-year frequency floods. The Base is bounded on three sides (east, south, and west) by swamplands. Local drainage of storm runoff for the majority of the Base is directed through drainage channels, running parallel to the south runway (runway 13-31), to an unnamed tributary of Cedar Creek, which flows southeast towards the Broward River. Occupational and Environmental Health Laboratory (OEHL) analytical test results

of samples of storm drainage flowing from a Base oil/water separator (OWS) are presented in Appendix F.

2. Groundwater

Groundwater supplies in the Jacksonville area are obtained mainly from three types of aquifers: surficial sand beds; relatively thin limestone, shell, and sand beds between 50 and 150 feet below the surface; and thick limestone and dolomite beds below 300 to 600 feet. The thick limestone and dolomite beds comprise the "Floridan Aquifer," which is the principle source of potable water supplies in the area. The surficial sand beds and thin limestone are used primarily for domestic supplies, groundwater heat pumps, and lawn sprinkling (Leve, 1969). The surficial sand aquifer is approximately 20 feet thick. Base soil boring records indicate that the water table on Base property, which is equivalent to the top of the surficial aquifer, is very shallow; in some places occurring within 2.5 feet of the surface (Reynolds, 1972).

The surficial sand aquifer is recharged predominantly by local rainwater (Leve, 1969). Local wetlands and streams adjacent to the base represent discharge points for this shallow groundwater. Consequently, the flow direction of shallow groundwater beneath the central portion of the base is southwest, towards adjacent swamplands. Groundwater underlying the western and eastern borders of the base flows in northwesterly and southeasterly directions respectively, towards wetland discharge points more proximate to these areas. Discharge from the surficial sand aquifer also occurs vertically into the underlying aquifer.

Except for instances of elevated iron levels, water in the surficial sand aquifer is generally suitable for drinking (Leve, 1969). However, it is not available in great supply, and there are no wells in the vicinity of the base tapping this aquifer source.

The next deepest aquifer underlying the surficial sand aquifer is the limestone, shell and sand aquifer. This aquifer occurs at the base of Pliocene and upper Miocene deposits, approximately 65 to 80 feet below the land surface.

The aquifer is hydraulically connected to the surficial sand aquifer, and is recharged locally by downward percolation of water from this aquifer. Several wells operated by the Base are screened within the limestone, shell and sand aquifer at a depth of 78 to 82 feet. These wells supply five heat pumps, but do not supply drinking water. One 480-foot-deep artesian well installed on the Base is used for the Base heating/cooling plant and, if necessary, is available as an emergency drinking and fire fighting water supply. Other wells tapping the limestone, shell, and sand aquifer are installed at private residences near the Base; these wells are used for drinking water. The nearest of the drinking water wells is located approximately 0.5 mile west of the Base, off Lem Turner Road.

Sufficient data is unavailable to determine the flow gradient of water within the limestone, shell, and sand aquifer. Given that this aquifer is recharged by the surficial sand aquifer, it is possible that potentially contaminated shallow groundwater could reach residential wells screened in the limestone, shell, and sand aquifer, via lateral flow near the surface and subsequent downward percolation. Analytical data indicating the lateral flow rate of shallow groundwater flow is not available. However, inasmuch as groundwater flow is affected by local topographic relief, which is slight to nonexistent at the Base, a relatively slow flow rate is estimated. The occurrence of less permeable silty clayey sandy soils together with primarily sandy soils, suggests that the groundwater flow rate is variable; with groundwater moving slower in less permeable soils of higher clay content, and more rapidly in predominantly sandy soils.

The primary source of drinking water in the Jacksonville area is the Floridan Aquifer. The Base derives its drinking water from the Floridan Aquifer through two 1,100 foot deep wells, located on JIAP property. Most hotels and industries around the Base also utilize this aquifer for drinking water. The aquifer is comprised of limestone and dolomite formations of Eocene and Paleocene age. Water within the aquifer is obtained from a series of relatively permeable zones that are separated by relatively impermeable zones. At the Base, the top of the Floridan Aquifer is approximately 300 feet from the land surface (Leve, 1969). Beds of relatively impermeable silty clay, marl, and do-

lomite overlie and confine the water under artesian pressure. The occurrence of confining layers over the Floridan Aquifer minimizes risks posed to this drinking water source from surface contamination.

Recharge to the Floridan Aquifer is from rainwater and from surface lakes and streams located in areas away from the Base where the aquifer is exposed. In some areas, the aquifer is recharged where overlying confining beds are relatively thin or are breached by sinkholes. Most Floridan Aquifer recharge in the region occurs in areas about 30 to 60 miles southwest of Jacksonville. Water in the aquifer moves laterally towards Jacksonville and the Base, in a northeast direction towards points of ultimate discharge (Leve, 1969).

IV. SITE EVALUATION

A. Activity Review

A review of Base records and interviews with past and present Base employees resulted in the identification of specific operations within each activity in which the majority of industrial chemicals are handled and hazardous wastes are generated. Table 1 summarizes the major operations associated with each activity, provides estimates of the quantities of waste currently being generated by these operations, and describes the past and present disposal methods for the wastes. If an operation is not listed in Table 1, then that operation has been determined on a best-estimate basis to produce negligible quantities of wastes ultimately requiring disposal.

B. Disposal/Spill Site Identification, Evaluation, and Hazard Assessment

Interviews with 16 installation personnel (Appendix B) and subsequent site inspections resulted in the identification of 7 potentially contaminated waste disposal/spill sites. It was determined that five of the sites are potentially contaminated with hazardous materials resulting from ANG operations; contaminants at each of these sites exhibit a potential for migration. These sites should be further evaluated. Four of these sites were scored using HARM (Appendix D). Figure 3 illustrates the locations of the scored/unscored sites. Copies of the completed Hazardous Assessment Rating Forms are found in Appendix E. Also included in Appendix E is a summary and explanation of the factor rating criteria used to score the sites. Table 2 summarizes the Hazard Assessment Scores (HAS) for each of the scored sites.

As mentioned, there is a potential for contaminant migration at each of the HARM scored sites (and at one unscored site). At Site Nos. 1, 2, 3, and 7, the contaminant migration pathway of primary concern is the groundwater route, and the most likely potential human receptor of potential groundwater contamination are owners of residential wells near the Base. The nearest of these wells is approximately 0.5 mile west of the Base. As direction of shallow groundwater flow could not be determined, it is possible that contaminants from the Base could reach these wells. Officials of the St. John's Water Management District

Table 1. Hazardous Waste Disposal Summary: Florida Air National Guard, Jacksonville International Airport, Jacksonville, Florida

SHOP NAME	LOCATION (Building No.)	WASTE MATERIAL	WASTE QUANTITY Gal./Year	METHODS OF TREATMENT, STORAGE AND DISPOSAL 1968 – 1976	1976 – 1986
Aerospace Ground Equipment Maintenance	23	PD-680	1	STRM SEW	STRM SEW
		1,1,1-Tichloroethane	1	STRM SEW	STRM SEW
		Used Oil	600	CONTR	DRMO
		Hydraulic Fluid	50	CONTR	DRMO
		Used Batteries	36 units/yr.	CONTR	CONTR
		Battery Electrolyte	15	NEUTR	NEUTR
		Slop Wastes - solvents - paint thinners - paint	100	CONTR FTA	DRMO
Corrosion Control	22	1,1,1-Trichloroethane	1	CONTR	DRMO
		Slop Wastes	50	CONTR FTA	DRMO
		Alodine Solution	10	STRM SEW	DRMO
Air Weapons Control Shop	1	1,1,1-Trichloroethane	5	CONTR	DRMO
Motor Pool	7	Used Oil	480	FTA CONTR	DRMO
		Transmission Fluid	120	FTA CONTR	DRMO

KEY:
GRND - Disposed of on the Ground
STRM SEW - Drained to Storm Sewer
SAN SEWER - Drained to Sanitary Sewer
NEUTR - Neutralized and Drained to Storm Sewer
FTA - Fire Training Activities
DRMO - Disposed of by Defense Reutilization and Marketing Office
CONTR - Disposed of by Contractor

Table 1. Hazardous Waste Disposal Summary: Florida Air National Guard, Jacksonville International Airport, Jacksonville, Florida (Continued)

SHOP NAME	LOCATION (Building No.)	WASTE MATERIAL	WASTE QUANTITY Gal./Year	METHODS OF TREATMENT, STORAGE AND DISPOSAL 1968 — 1976 — 1986
Motor Pool (Continued)				
		Parts Cleaner	40	CONTR
		Spent Batteries	10 units/yr.	CONTR
		Battery Electrolyte	3	NEUTR SAN
Fuels Bulk Storage	21	Waste Fuel	500	FTA / CONTR; DRMO
Engine Maintenance	23	Waste Oil	380	FTA; DRMO
		JP-4	50	FTA; DRMO
		Solvents	40	FTA; DRMO
		Carbon Cleaner	10	FTA; DRMO
Structural Repair	1	Methyl Ethyl Ketone	5	CONTR / FTA; DRMO
Pneudraulics	1	PD-680	60	CONTR / FTA; DRMO
		Hydraulic Fluid	180	CONTR; DRMO

KEY: GRND - Disposed of on the Ground
STRM SEW - Drained to Storm Sewer
SAN SEWER - Drained to Sanitary Sewer
NEUTR - Neutralized and Drained to Storm Sewer
FTA - Fire Training Activities
DRMO - Disposed of by Defense Reutilization and Marketing Office
CONTR - Disposed of by Contractor

Table 1. Hazardous Waste Disposal Summary: Florida Air National Guard, Jacksonville International Airport, Jacksonville, Florida (Continued)

SHOP NAME	LOCATION (Building No.)	WASTE MATERIAL	WASTE QUANTITY Gal./Year	METHODS OF TREATMENT, STORAGE AND DISPOSAL 1968 — 1976 — 1986
Missile Maintenance	20	Lacquer Thinner	10	GRND (1968–1986)
		Paint	3	GRND (1968–1986)
Tire and Wheel	1	PD-680	30	STRM SEW (1968–1986)
		Cleaning Compound	30	STRM SEW (1968–1986)
		Aromatic Solvents	20	FTA / CONTR — DRMO
		Strippers	20	CONTR — DRMO
Flightline	1	JP-4	9,000	CONTR / FTA — DRMO

KEY: GRND - Disposed of on the Ground
STRM SEW - Drained to Storm Sewer
SAN SEWER - Drained to Sanitary Sewer
NEUTR - Neutralized and Drained to Storm Sewer
FTA - Fire Training Activities
DRMO - Disposed of by Defense Reutilization and Marketing Office
CONTR - Disposed of by Contractor

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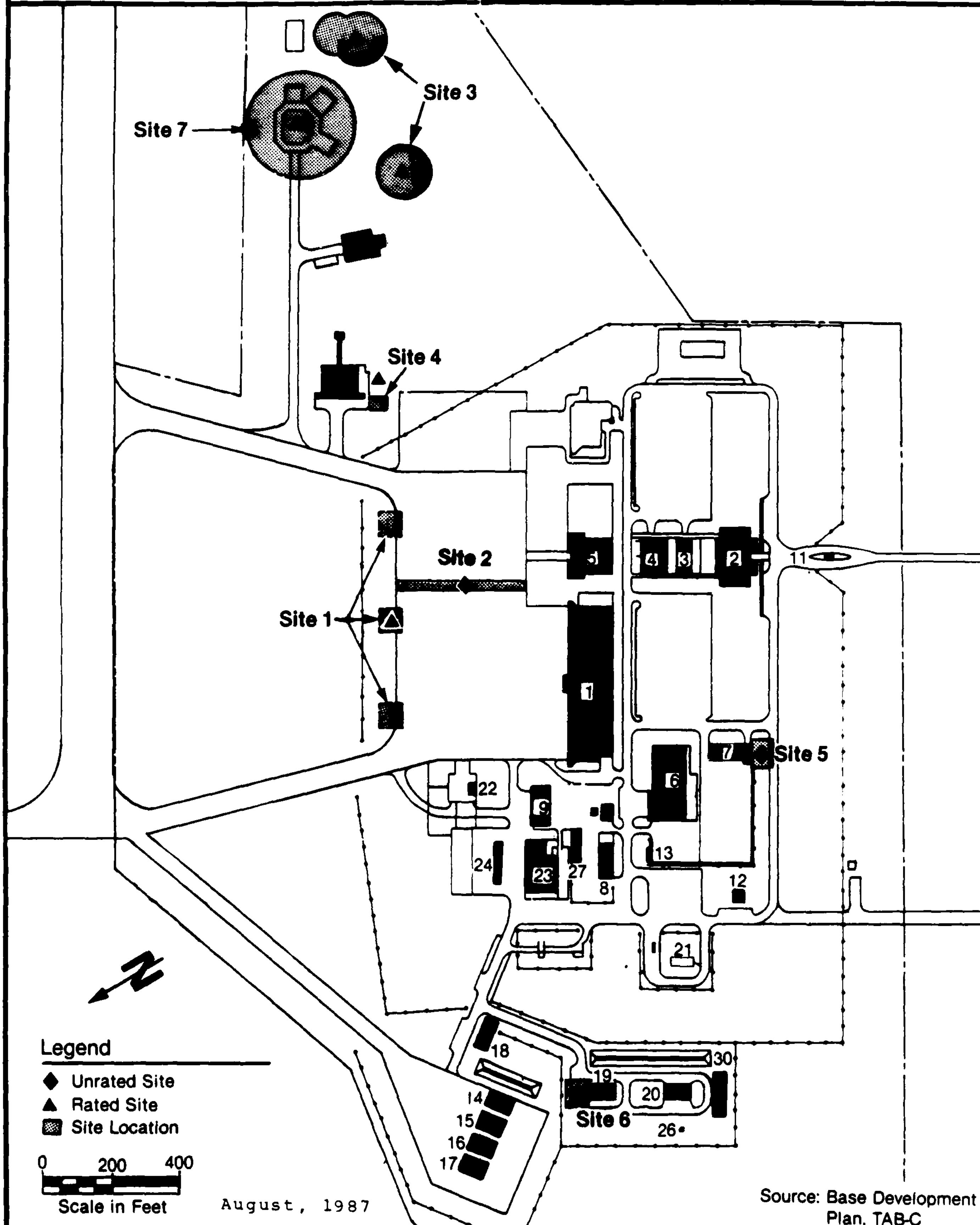
Figure 3.

Location of Rated/Unrated Sites at Florida Air National Guard, Jacksonville International Airport, Jacksonville, Florida.



August, 1987

Source: Base Development Plan, TAB-C

Table 2. Site Hazard Assessment Scores (as derived from HARM): Florida Air National Guard, Jacksonville International Airport, Jacksonville, Florida

Site Priority	Site No.	Site Description	Receptor	Waste Characteristics	Pathway	Waste Mgmt. Practices	Overall Score
1	7	Trim Pad for Aircraft Run-Up	71	90	69	1.0	77
2	3	Fire Training Area	71	80	69	1.0	73
3	1	OWS Inlets Along Aircraft Parking Apron	71	72	69	1.0	71
4	4	OWS at the Hush House (Building 25)	71	54	80	1.0	68

report that wells of most private residences in the area of the Base are screened at a depth of 75 to 85 feet within an unconfined aquifer comprised of limestone, shell, and sand beds. There are no hydraulic barriers present which can be considered significantly effective in separating shallow groundwater at the water table from deeper groundwater where these wells are screened. Consequently, these wells are susceptible to contamination from surface or shallow subsurface sources.

At Site No. 4, the contaminant pathway of primary concern is surface water. Water at this site exhibits visible petroleum, oil, and lubricant (POL) contamination. Potential receptors to this contamination are the plant and animal species of the wetland ecosystem existing adjacent to the Base. Potential human receptors to surface water contamination include consumers of fish species living in these waters.

Site No. 1 - OWS Inlets Along Aircraft Parking Apron (HAS-71)

This site is comprised of the area surrounding three storm sewer inlets located along the northern, downgradient edge of the Base aircraft parking apron. These inlets are designed to mechanically open and collect surface runoff and fuel spills from the aircraft parking apron. From the inlets, runoff would be routed to an OWS before ultimately discharging offbase into surface streams. Interviewees reported that the inlets have not functioned properly for at least 10 years, and allow runoff to flow over and around, rather than into the drain holes. Runoff from the aircraft parking apron occasionally contains contaminants from fuel spills that occur on the apron, and also from small spills of solvents and cleaners used on the parking apron. Spills of up to 100 gallons of JP-4 are reported to have frequently occurred. The F-106 aircraft, which has been used at the Base since 1974, has a propensity to vent large quantities of fuel. Spills on the parking apron from this source are not uncommon, although the majority of the spilled fuel probably evaporates.

Given the amount of time that the OWS inlets at this site have been malfunctioning, it is estimated that up to four thousand gallons of fuel and other wastes may remain along the edge of the parking apron. The area around these drainage inlets shows visible signs of vegetative stress. Potentially contaminated runoff from this site presents a potential threat to underlying groundwater, which is within 2.5 feet of the surface at some places and is overlain by moderately to rapidly permeable soils. The nearest receptors to potentially contaminated groundwater are private well owners, approximately 0.5 mile west of the site. To prioritize the potential threat posed by this site, a HAS was applied.

Site No. 2 - Subsurface of Aircraft Parking Apron - (Unrated)

This site consists of a portion of ground beneath the Base aircraft parking apron concrete. There are indications that the subsurface of the parking apron may, in some places, be contaminated with jet fuel. Interviewees reported that in 1980 or 1981, workers were overwhelmed by fumes when a portion of the apron was excavated to repair a breached electrical conduit. To resume work, respirators were necessary. The exact source of the fumes is unknown; no underground storage tanks (UST) or underground fuel lines are located in this area. The most likely explanation is that the ground beneath the aircraft parking apron is saturated as a result of numerous fuel spills of up to 100 gallons which have occurred on the apron. The integrity of pavement sealant on the apron was previously inadequate, and would have allowed spillage to seep through the cracks and joints. Because the exact nature and quantities of contaminants present at this site is unknown, a HAS could not be applied. However, first hand accounts indicate that contamination of some sort is present at this site; therefore, additional IRP work is appropriate. It should be stressed, too, that this site was discovered accidentally; if indeed the source of the fumes at this location is spillage seeping through cracks in the parking apron, then it is probable that contamination extends to areas beyond this particular excavation site, and possibly includes the majority of the apron.

Site No. 3 - Fire Training Area (FTA) (HAS-73)

This site is located in the eastern portion of the Base property, as indicated in Figure 3. The site consists of three locations jointly used from 1968 to 1984 by the Base and Jacksonville Port Authority for fire training activities. The isolated northwestern pit was the initial Base FTA, used from 1968 until the mid-1970's. The remaining two areas were used concurrently from the mid-1970's until 1984. Since 1984, no fire training activities have occurred on Base property. During the years the FTA was in use, three to four 55-gallon drums of JP-4 were released for each fire training event. Interviewees also reported that spent solvents, used oils, "slop wastes," and other flammables were burned in the fire training pits. The pits consist of unlined open earthen areas, with no containment of any kind. Vegetative stress was visible at the two more recently used FTA locations and the smell of POL products was detectable in the exposed soil. It is estimated (on a basis of one fire training exercise every three months from 1968 to 1976, using four drums of flammable liquids per exercise) that approximately 6,400 gallons of hazardous waste have been released at the old FTA. Assuming that up to 70 percent of the flammables released at the FTA were destroyed, approximately 2,000 gallons remained to either evaporate, seep into the ground, or run off along surface drainage routes. The amount of material released at the two more recently used FTA's (located approximately 100 yards east of the old FTA) is equivalent to that released at the old FTA.

Due to the potential threats to local surface and groundwater by contaminants released at the FTA, a HAS was applied and follow-on IRP work recommended. Factors contributing to groundwater susceptibility include moderate to rapidly permeable soils at this site and a relatively shallow water table, possibly within 2.5 feet of the surface. Potential receptors to groundwater contamination are private well owners, located approximately 0.5 miles west of the sites. Local surface water and wetlands could also potentially be affected if contamination is present at this site. A small stream, which flows within 15 yards of the FTA and drains into a marsh area to the south, may serve as a point of discharge for potentially contaminated groundwater.

Site No. 4 - OWS at the Hush House (Bldg. 25) (HAS-68)

This site is located on the south side of the Hush House and consists of a malfunctioning OWS. The OWS, located on the south side of the Hush House, is apparently filled to capacity and is overflowing, releasing POL products into a nearby surface stream. Interviewees reported that the separator has not been drained for several years because the bolts on the opening are corroded in place. The smell of POL products was detectable in the air at this site. Wastes discharged from the Hush House into the OWS include waste fuel, PD-680, and oil. In addition to the overflowing OWS at this site, there are also signs of environmental stress and contamination along the perimeter of an asphalt area immediately adjacent to the OWS at the Hush House, probably resulting from POL tainted runoff from the asphalt pad. The edge of this asphalt area will also be considered as part of Site No. 5.

A HAS was applied to this site because of threats presented to nearby wetland habitats, and because of potential threats to groundwater underlying this site.

The nature of this site precludes precise determination of the total amount of contaminants released. However, a conservative estimate based upon visual evidence at the site suggests a release rate of 0.5 to 1 gallon per day. Interviewees were not certain when wastes began seeping from the separator, although they said it had been at least several years. Extrapolating for three years, using the higher end of the estimated release rate mentioned above, results in a total loss to date of approximately 1,000 gallons of contaminants. Releases of 1,000 gallons or less are considered small quantity releases under HARM.

Site No. 5 - OWS at Vehicle Maintenance Building (Bldg. No. 7) - (Unrated)

This site encompasses the area next to the OWS at the Vehicle Maintenance Building (Bldg. No. 7). Interviewees reported that this OWS has a continuous history of malfunctioning resulting in leakage. This OWS is designed to inter-

cept normal drainage and spills entering the floor drain of the Vehicle Maintenance Building. Substances used in the vehicle maintenance shop include transmission fluid, used oil, solvents/parts washer, and battery electrolyte. No major spills are noted to have occurred at this facility.

The limited extent of environmental stress in the area of this OWS indicates that leaks have been minor and infrequent. Contaminants released at this site are not entering surface water. Given the limited quantity of liquid released from the OWS at any one time, it is likely that much is lost to evaporation. The appearance of the site suggested that the quantity of waste absorbed into the ground up to the point in time of the HMTC site visit did not pose a threat to underlying groundwater. Thus, provided malfunctioning of the OWS does not worsen or continue unabated, a HAS is not necessary at this site and no further work under the IRP program is required here.

Site No. 6 - Area Outside the Munitions Building (Bldg. No. 19) - (Unrated)

This site is located outside of the back door of the Munitions Building. It consists of a small patch of ground where limited amounts of solvents and lacquer thinner were occasionally discarded. Interviewees reported that from 1968 to 1980, approximately 10 gallons per year of the above named substances were disposed of at this location. Due to the volatile nature of the substances released at this site (methyl ethyl ketone and other volatile solvents) and the limited volume disposed of at any one time, the majority of the discarded substances probably evaporated shortly after their release. A six inch layer of soil at this location was recently removed. It is doubtful that the small amount of substances released at this site would have migrated to depths much below the surface level of soil that was removed. The environmental threat posed by this site is considered insignificant, and a HAS was unnecessary.

Site No. 7 - Trim Pad for Aircraft Run-up (HAS-77)

This site has been used for jet engine trim under full military power since

1968. The F-106 aircraft, which was brought to the base in 1974, is known for its propensity to vent large quantities of fuel. As a result, spills of up to 400 gallons of JP-4 have occurred at this site during engine run-up activities. Base personnel reported that this site is used between 1 and 2 times each day. In the past, fuel spills on the Trim Pad were washed down by the fire department. At most, four hundred gallons were released at this site in any single event. Using a moderate estimate of 100 gallons per spill event, and calculating for over an 18 year period results in an estimated total spillage of 450,000 gallons of JP-4. Assuming that 70 percent of the spilled fuel probably evaporated, 135,000 gallons of fuel may remain at this site. Risks posed to groundwater quality at the Base by such large releases at the Trim Pad make a HAS necessary. Underlying groundwater is susceptible to contamination as a result of moderately to rapidly permeable soils at this site, which overlie a relatively shallow water table (at some places within 2.5 feet of the surface). Potential receptors of groundwater contamination are well owners located approximately 0.5 mile west of this site.

C. Critical Habitats/Endangered or Threatened Species

Correspondence from the Florida Game and Freshwater Fish Commission indicates that there are no endangered or threatened species of flora or fauna in the vicinity of the Base. There are no areas designated as critical habitats, or wilderness areas in the vicinity of the Base. There are wetland areas bordering the Base boundaries.

V. CONCLUSIONS

- Information obtained through interviews with 16 Base personnel, review of Base records, and field observations has resulted in the identification of seven potentially contaminated disposal/spill sites on the Base. There is a potential for contaminant migration at five of the seven sites; therefore, further IRP analysis should be performed at these locations.

- Four of the five sites recommended for follow-up IRP action (Site Nos. 1, 3, 4, and 7) have been scored using the Air Force HARM. Visible evidence of contamination is present at each of these sites. Site No. 2 was recommended for further IRP work but not scored. At this site, sufficient information concerning the hazardous materials involved (i.e., type, quantity, and source) was not available to determine a HAS. Site Nos. 5 and 6 were not scored under HARM because they are not considered to present a significant potential for contaminant migration. Past releases at Site No. 5 have been minor and intermittent. At the time of the HMTC visit, no visual evidence suggested that contaminants were present in sufficient quantity to present a threat to the environment. The majority of contaminants released at Site No. 6 were volatile and most likely evaporated upon release; any that remained were probably removed when a layer of soil was removed from this site.

- No direct or indirect evidence of groundwater contamination was discovered at the Base; however, the overall groundwater and geologic environment makes underlying aquifers susceptible to contamination from surface sources. Geologic characteristics at the base contributing to this susceptbility include the presence of moderately to rapidly permeable (4.2 x 10^{-4} cm/sec to 1.4 x 10^{-2} cm/sec) soils and a shallow groundwater table (within 2.5 feet of the surface in some places). Wells supplying drinking water for the Base and for the JIAP are located between 0.5 to 0.75 miles east of the closest identified potential waste site. These wells are deep wells installed within a confined aquifer and are not considered to be threatened by potential contamination at the Base. The most likely receptors to potential groundwater contamination are local res-

idences whose wells are screened in a shallow, unconfined, unconsolidated aquifer. The nearest of these shallow wells is approximately 0.5 mile west of the Base.

- At Site No. 5, contaminants from a malfunctioning OWS are seeping into a local surface stream. The malfunctioning OWS is downstream from any possible contaminant interception devices, and contaminants from this point may migrate offsite into local wetland areas. With the exception of this site, no evidence of offbase environmental stress was observed in the immediate vicinity of the boundary of the Base.

- Further site investigations will be required in order to fully characterize areas of potential contamination at the Base.

VI. RECOMMENDATIONS

There is potential for contaminant migration at the Florida ANG, 125th FIG, Jacksonville IAP; therefore, initial stages of the IRP Phase II/IVA are recommended.

The following general recommendations are intended to aid in the confirmation of the presence of suspected contamination, or to show that no contamination exists.

Site No. 1 - OWS Inlets Along Aircraft Parking Apron

It is recommended that one shallow soil boring be installed at the down-gradient edge of each of the three OWS inlets. Borings should be installed to a depth of 15 feet with samples taken at the surface and at 5 foot intervals. Water samples should be taken from the boreholes at this site to check for possible contamination of any groundwater encountered in the boreholes. These water samples should be taken on a one-time-only basis. Soil and water samples should be analyzed for aromatic volatile organics and petroleum hydrocarbons. If results of this sampling indicate extensive contamination, groundwater monitoring wells should be installed and additional soil sampling should be conducted to define the depth and area of contamination.

Site No. 2 - Subsurface of Aircraft Parking Apron

Excavation beneath the aircraft parking apron for the purpose of conduit repairs resulted in the exposure of workmen to heavy concentrations of POL fumes. To determine if contaminants are present at this site, shallow soil borings should be installed to a depth of 15 feet, at the location of the original excavation. Soil samples should be taken at 5-foot intervals and analyzed for aromatic volatile organics and petroleum hydrocarbons If contamination is confirmed in this soil boring, appropriate geophysical/geochemical detection methods should be considered to delineate the extent of contamination at this site. Geophysical methods, such as electromagnetic terrain conductivity surveys, allow detection of POL contaminants with minimal disturbance of the concrete parking apron.

Site No. 3 - Fire Training Area

From 1968 to 1984, this site was regularly used for fire training activities. Large quantities of JP-4 and other flammable chemicals were dumped onto the open ground here. The fire training pits are unlined and there are no containment structures.

Soil borings should be installed at each of the three fire training pits. The borings should be installed to a depth of 15 feet with samples taken at 5-foot intervals. Water entering the borings should also be sampled to detect potential contamination of shallow groundwater at this site. These borehole water samples should be taken on a one-time-only basis.

Three monitoring wells should be installed into the shallow aquifer, to a depth of approximately 25 to 35 feet. Two of these wells should be installed hydraulically downgradient to southern edges of the two FTAs. The third well should be an upgradient background well. Care should be taken to ensure that the background well is upgradient of other base sites as well.

Water and sediment samples should be taken from portions of wetland areas nearest to the FTA to determine if potentially contaminated shallow groundwater is discharging into surface water.

All samples taken at the FTA should be analyzed for halogenated and aromatic volatile organics, and petroleum hydrocarbons. Water samples should also be analyzed for total organic carbon.

Site No. 4 - OWS at the Hush House

The OWS at this site has been malfunctioning for several years, allowing POL products to discharge into a small stream that flows into adjacent wetlands.

Two soil borings should be installed on the outflow side of the OWS to determine if contaminants have permeated the underlying soils. Borings should be installed to a depth of 15 feet, and samples taken at 5-foot intervals. On a one-time-only basis, water samples should be taken from any groundwater entering the boreholes, to determine if contaminants discharging from the OWS are infiltrating into underlying groundwater. Sediment samples should be taken from the stream bed into which the OWS is discharging; samples should be taken at the OWS and downstream to a point where visible evidence of contamination is no longer apparent. All samples should be analyzed for halogenated and aromatic volatile organics and petroleum hydrocarbons.

Site No. 7 - Trim Pad for Aircraft Run-up

An estimated 450,000 gallons of JP-4 may have spilled on the Trim Pad from 1968 to 1986. Although most of this spilled fuel probably evaporated, over 100,000 gallons of fuel may remain in the soils surrounding the Trim Pad. Three soil borings should be installed along the edges of the Trim Pad, to a depth of 15 feet. Samples should be taken at the surface and at 5-foot intervals. On a one-time-only basis, samples should be taken of water infiltrating the borings.

The soil boring installed on the southwest side of the Trim Pad should be extended to a depth of approximately 25 to 35 feet, and a monitoring well installed. This site is hydraulically upgradient of Site No. 3, the FTA. Therefore, water samples from the FTA should be compared with those from the Trim Pad to distinguish the specific contaminant sources, if contamination is present.

All samples from Site No. 7 should be analyzed for petroleum hydrocarbons, and aromatic volatile organics.

GLOSSARY OF TERMS

AQUIFER - A geologic formation, or group of formations, that contains sufficient saturated permeable material to conduct groundwater and to yield economically significant quantities of groundwater to wells and springs.

CONTAMINANT - As defined by Section 101(f)(33) of SARA shall include, but not be limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction), or physical deformation in such organisms or their offspring; except that the term "contaminant" shall not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under

(a) any substance designated pursuant to Section 311(b)(2)(A) of the Federal Water Pollution Control Act,

(b) any element, compound, mixture, solution, or substance designated pursuant to Section 102 of this Act,

(c) any hazardous waste having the characteristics identified under or listed pursuant to Section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by Act of Congress),

(d) any toxic pollutant listed under Section 307(a) of the Federal Water Pollution Control Act,

(e) any hazardous air pollutant listed under Section 112 of the Clean Air Act, and

(f) any imminently hazardous chemical substance or mixture with respect to which the administrator has taken action pursuant to Section 7 of the Toxic Substance Control Act;

and shall not include natural gas, liquefied natural gas, or synthetic gas of pipeline quality (or mixtures of natural gas and such synthetic gas).

CRITICAL HABITAT - The native environment of an animal or plant which, due either to the uniqueness of the organism or the sensitivity of the environment, is susceptible to adverse reactions in response to environmental changes such as may be induced by chemical contaminants.

DISCHARGE - The release of any wastestream, or any constituent thereof, to the environment which is not recovered.

DOWNGRADIENT - A direction that is topographically or hydraulically down sloped; the direction in which groundwater flows.

ELECTROMAGNETIC TERRAIN CONDUCTIVITY SURVEY - A geophysical survey method used to measure the presence of subsurface contaminants through electromagnetic conductivity readings.

HARM - Hazard Assessment Rating Methodology - A system adopted and used by the United States Air Force to develop and maintain a priority listing of potentially contaminated sites on installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts. (Reference: DEQPPM 81-5, 11 December 1981).

HAS - Hazard Assessment Score - The score developed by utilizing the Hazardous Assessment Rating Methodology (HARM).

HAZARDOUS MATERIAL - Any substance or mixture of substances having properties capable of producing adverse effects on the health and safety of the human being. Specific regulatory definitions also found in OSHA and DOT rules.

HAZARDOUS WASTE - A solid or liquid waste that, because of its quantity, concentration, or physical, chemical, or infectious characteristics may

a. cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or

b. pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

MIGRATION (Contaminant) - The movement of contaminants tnrough pathways (groundwater, surface water, soil, and air).

PERMEABILITY - The capacity of a porous rock, sediment, or soil for transmitting a fluid without impairment of the structure of the medium; it is a measure of the relative ease of fluid flow under unequal pressure.

STRATUM - A section of a formation that consists throughout of approximately the same kind of rock material.

SURFACE WATER - All water exposed at the ground surface, including streams, rivers, ponds, and lakes.

UPGRADIENT - A direction that is topographically or hydraulically up slope.

WATER TABLE - The upper limit of the portion of the ground that is wholly saturated with water.

WETLANDS - Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

WILDERNESS AREA - Areas designated under Federal or State laws as wilderness areas to be managed for their aesthetic or natural value.

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Appendix A
Resumes of Search Team Members

ERIC A. KUHL

EDUCATION

B.A., political science/environmental policy, St. Mary's College of Maryland, 1982

Right To Know/Hazard Communication Seminar, Executive Enterprises, Inc. April 10-11, 1985

Environmental Laws and Regulations Course, Government Institutes, Inc. May 16-17, 1985

Geographic Aspects of Pollution, University of Maryland, University College, Fall 1984

EXPERIENCE

Three years of experience with on-line information systems, including analysis and summarization of legal/technical documentation pertinent to large-scale computerized litigation support projects. Regulatory experience involving research, tracking and analysis of federal and state transportation/motor carrier safety, environmental and occupational safety regulations, for eventual input into on-line data base systems. Currently conducting site investigations and preliminary assessments for the Air Force's Installation Restoration Program (IRP) and the Federal Bureau of Prisons.

EMPLOYMENT

Dynamac Corporation (1984-present): Staff Scientist

Responsibilities include site investigations, preliminary assessments, ano report writing for the Phase I portion of the IRP for the Air National Guard. Also performs similar work for the Department of Justice's Federal Bureau of Prisons. Activities for these tasks entail hazardous waste site identification and assessment, and development of advisory recommendations for further site investigation. Authored the Army Materiel Command's Solvent Recovery Regulatory Impact Report, and performed regulatory analysis for DLA's used drum recycling study.

Previously, participated in the construction of an environmental regulatory information system. This task required detailed familiarization with key environmental regulations including RCRA, CERCLA, and the Hazardous Materials Transportation Act. Was also responsible for tracking relevant legislation and regulations at the federal and state levels.

Automated Sciences Group (1983-1984): Regulatory Analyst

Performed regulatory analysis of the Occupational Safety and Health Administration's regulatory dockets for the OSHA Technical Information System. Also assisted in the compilation of technical guidelines for the OSHA Technical Information System.

Aspen Systems Corporation (1982-1983): Document Analyst

Analyzed and summarized technical documents on the various aspects of nuclear power plant construction for a large-scale litigation project. Was also responsible for screening large numbers of documents to determine their relevance to the case.

PUBLICATIONS

Controversies Emerge on OSHA's Hazard Communication Standard, co-author, HMTC Update 4(4), July 1985.

Used Oil Regulation Proposed, co-author, HMTC Technical Bulletin, HMTC Update 5(4), July 1986.

AMC Solvent Study, Evaluation of Regulatory Impact on Solvent Recovery, July 1986.

TIMOTHY N. GARDNER

Environmental Scientist

EDUCATION

M.A., Environmental Biology, Hood College
B.S., Forestry/Resource Management, West Virginia University

EXPERIENCE

Mr. Gardner has five years of technical experience in environmental control and research, with emphasis on risk assessment, chemical safety, radiation safety, hazardous waste management (chemical and radiologic), and activated carbon filtration research. His past responsibilities include site risk assessment, chemical and radioactive waste pickup and storage for disposal at a large cancer research facility, and chemical and radioactive spill control, as well as safety surveys and technical assistance in activated carbon desorption research.

EMPLOYMENT

Dynamac Corporation (1984-Present): Staff Scientist

At Dynamac, Mr. Gardner's responsibilities include site surveys and records searches for the Phase I portion of the Installation Restoration Program (IRP) for various Air National Guard Bases. Efforts include risk assessment, site prioritization, and remedial action recommendations. He has also been a contributing author for a closure-post closure plan for a hazardous waste landfill at Clovis AFB, plans and specifications for the removal of asbestos at several Air Force White Alice sites in Alaska, and the update and revision of a DLA regulation for "Disposal of Unwanted Radioactive Material."

NCI-Frederick Cancer Research Facility (1981-1984): Lab Technician

Mr. Gardner worked in radiation and chemical safety as well as environmental research. His responsibilities included monitoring personal and environmental air quality at work areas where free iodinations occurred, monitoring work areas and equipment for isotope contamination, periodic surveys to monitor compliance with NRC safety regulations, isotope inventory control, transfer of isotopes between licenses, and periodic calibration and maintenance of survey instruments. He was also responsible for radioactive and chemical waste pickup and storage for disposal, and served as an advisor for safety-related matters pertinent to radiation and radioactive waste, chemical safety, and industrial hygiene. In the environmental research division, he was involved in activated carbon desorption studies involving the use of analytic laboratory equipment.

PROFESSIONAL AFFILIATIONS

American Tree Farm Association
Hardwood Research Council
West Virginia Forestry Association

DONATO R. TELESCA

EDUCATION

B.S., Chemical Engineering, Massachusetts Institute of Technology
B.S., Business Administration, Major in Management, Rutgers University

EXPERIENCE

Mr. Telesca has 37 years of technical and managerial experience in process engineering, pollution control engineering, and solid waste and wastewater management. recent experience in Installation Restoration Program and remedial action for Army, Navy and Air Force. Developed quality assurance program for Corps of Engineers, Omaha. Directed health and safety studies in industry. Principal investigator in projects to identify and evaluate process design, alternative processing systems, characterize waste streams, product intermediates and uses, and disposal options.

Program manager for hazardous waste site cleanup projects involving ambient air monitoring, costing, locating buried drums, landfill excavation, well drilling, and groundwater monitoring; installation restoration program; removal of asbestos; redesign of industrial waste treatment plants; and identification of applicable federal, state and local regulations. Experienced in logistics of multitask projects requiring interdisciplinary field crews at nationwide sites.

EMPLOYMENT

Dynamac Corporation (1977-Present: Manager, Remedial Action and Treatment Department

Supervising ten professionals and supporting personnel in the department. Program manager and directly involved in:

- Phase I Installation Restoration Program, which included records search, interviews and hazardous waste onsite inspections at four Air National Guard, Air Force Bases.

- Development of design, specifications and cost estimates for remedial action for:

  - Removal of asbestos at 33 radar field sites
  - Removal of drums containing chlorinated solvents at NIROP, Fridley, Minnesota
  - Removal of drums containing DDT, Moody AFB
  - Removal of three contaminated tanks at Sacramento Army Depot
  - Removal of jet fuel from two Air Force Bases
  - Development of closure and post-closure plans for waste pile containing munitions and landfill containing hazardous waste (the latter including design specifications and cost estimates for the Phase IV remedial action plan).

- o Preparation of statement of work for Remedial Action Plan installation Restoration Program at 12 Air Force Bases.

- o Wrote the Quality Assurance Program for the Technical Representative of the Corps of Engineers, Omaha District, for NIROP.

- o Directed the study "Thermal Destruction of Low Level Hazardous Wastes in Navy Boilers and Incinerators" which consisted of four phases: Problem Definition, Assessment of State of Technology, Technology projections, and Alternatives and Capability Goals.

- o Program manager for a project to "identify and assess potential hazardous waste disposal sites at ten installations operated by the Federal Bureau of Prisons.

- o Manages multitask projects requiring interdisciplinary staff.

- o Manages crews doing onsite field studies for programs listed earlier.

- o Has directed teams making quick response (within 2 days) to emergency situations at locations in New Mexico, Oklahoma, Alaska and California.

- o Directed onsite industry studies to assess pollution control systems for reducing inorganic mercury in waste streams; also studied several industries to develop generic pollutant standards for industries using similar processes (unit processing studies); e.g., hydrocarbon chlorination.

- o Investigator on EPA hazardous waste listing program under RCRA.

- o Studied process redesign and engineering controls for several DOD fabrication and maintenance operations, including degreasing, electroplating, paint still bottoms and sludges.

- o Characterized wastewater industrial discharges in a study of 343 industries; chemical and physical data were used to establish pollutant impact, and the need for engineering controls, wastewater stabilization ponds, onsite treatment systems and land disposal systems.

<u>Electro-Nucleonics Laboratories, Inc. (1973-1977)</u>: Director of Manufacturing

Responsible for establishing protocols for production and adherence to quality control standards. Also assisted in establishing standards and techniques in radioimmunoassay diagnostic work.

Responsible for specifications, and purchase of instrumentation used in the manufacturing facilities. Was responsible for the disposal of regular biological and radioactive waste.

W. R. Grace and Company (1961-1973): Manager of Process Development

Evaluated regulatory compliance of W. R. Grace Nuclear Reprocessing plant in New York for hazardous waste disposal methods. Where such methods were unsatisfactory, designed improvements such as removal of contaminated filters in high radioactivity area; redesign of collection system for hazardous wastewater; design of procedures for burying the radioactive liquids and solid wastes received from outside the plant. Sampled New York State waters and took soil samples from surrounding farms to determine the extent of contamination by hazardous materials.

Designed new manufacturing procedures to reduce generation of hazardous waste from polycrystalline silica manufacturing. Designed, reviewed and implemented the procedures for disposal of hazardous wastes which included chlorinated hydrocarbon, hydrochloric acid, sodium hydroxide and by-products from the manufacturing process.

Evaluated existing procedures and recommended changes in the collection and disposal of hazardous solids and liquids, including heavy metals, acids, bases and organometals.

For Bechtel and Nuclear Fuel Services certified that construction of a nuclear reprocessing plant met all specifications for disposal of hazardous wastes, including radioactive uranium and daughter products, acids, bases and alcohols. Also assisted in the installation and operation of continuous sampling of plant streams discharging into state waters.

As plant manager of Nuclear Development Facility and Ceramic Facility, was responsible for process procedures and development of equipment. Also produced development quantities of nuclear fuels. Was responsible for collection of solid and liquid radioactive wastes, which were generated in the facility. Redesigned distillation system incorporating infrared detector instrumentation for control of distillation column.

As manager of Process Development, had technical and administrative responsibilities for four chemical engineers and ten technicians. Responsible for control of gaseous, solids, and water emissions from operating equipment. Worked with spray towers, cyclones, hydroclones, filters, spray dryers, etc.

As Staff Project Engineer of Division General Management Group, had technical and administrative responsibilities with regard to expansion projects.

As Production Manager of Chemicals Division, had management responsibilities for production, maintenance and engineering development, quality control and waste disposal for seven producing units. Some o the products produced were: rare earths and polishing compounds, raney nickel, silica gel, desiccant clay, sodium silicate, cracked catalysts and specialty catalysts.

As Project Manager of Water Processing Department, worked primarily on an M&O proposal for an Office of Saline Water contract. Assisted in development of anticorrosion studies for desalination equipment.

Grace Electronics Chemicals, Inc. (1960-1961): Vice President and General Manager; President, International Metalloids

General management responsibilities for overall operation of a silicon monocrystalline production, including P&L statements and direct manufacturing costs.

International Metalloids (1959-1960): Vice President and General Manager

Designed standard operating procedures for polycrystalline silicon production, including control technology for gaseous, liquid and waste missions. Redesigned instrumentation for production of high-purity polycrystalling silicon at thermal cracking furnaces. Was directly responsible for adherence to Puerto Rican regulations regarding hazardous wastes.

Davison Chemicals Company (1954-1959): Chemical Engineer

Developed processes for catalysts, projecting them from scale to preproduction quantities. Redesigned instrument on process equipment at alumina plant to reduce loss of pentasol (5-carbon chain alcohol).

Was responsible for operation and maintenance of a recycle air system in the tabletting area of the plant. Was a member of the engineering team representing Grace at the Maryland Clean Water Committee meetings, where standard methods of sampling and control of liquid wastes were formulated.

Hercules Powder Company (1948-1954): Senior Chemical Engineer

Designed instrumentation and changes in plant processes to reduce contamination of waste streams. Process changes were developed to reduce pH, COD, BOD, solids, and total volume.

Invented a new production process and instituted new procedures required for the collection and proper disposal of chlorinated rubber and chlorinated off-grade product, carbon tetrachloride, rubber waste and hydrochloric acid waste.

Developed procedures for the collection and disposal of hazardous wastes resulting from the manufacture of pilot plant log sizes of sodium carboxymethyl cellulose, plasticizers and other organic based products.

Supervised the operations for disposal of hazardous waste materials from the nitric acid manufacturing unit, sulfuric acid concentrations, nitrocellulose manufacturing and packaging facilities, alcohol distillation unit and cellulose acetate manufacturing facilities.

<u>MIT Chemical Warfare Development Laboratory; U.S. Naval Gun Factory; Marin Manufacturing and Supply Company (1940-1947)</u>: Senior Engineer and Draftsman

Made original layouts and designs on various mechanical equipment.

AFFILIATION

American Institute of Chemical Engineers

PUBLICATIONS AND PRESENTATIONS

Telesca, D.R., "The Adsorption of Ethylene-Ethane and Ethylene-Propylene on Activated Carbon." Massachusetts Institute of Technology, Chemical Engineering, 1948.

Telesca, D.R., J.M. Evans, and R.K. Tanita. "Process and Equipment Problems and Solutions in Coal Conversion Processes." Presented at ACS Symposium on Occupational Health Control in Fossil Energy Technologies. Washington, DC, September 10, 1979.

Evans, J.M., R.K. Tanita, and D.R. Telesca. "Comparative Practices in Worker Protection." Presented at ACS Symposium on Occupational Health Control in Fossil Energy Technologies, Washington, DC, September 10, 1979.

Telesca, D.R., J.H. Bochinski, and J.A. Gideon. "Review of NIOSH Control Technology Studies to Date." Presented at the Safety and Health Division Symposium of the American Institute of Chemical engineers, Boston, Massachusetts, August 1979.

Telesca, D.R. "Means of Implementation of Controls." Presented at the NIOSH Symposium on Control Technology in the Plastics and Resins Industry, Atlanta, Georgia, February 27, 1979.

Gideon, J., L. Reed, and D.R. Telesca. "Control Technology for Coal Gasification and Liquefaction." Presented at the Second Annual NIOSH Symposium, Rockville, Maryland, October 29-31, 1979.

Bochinski, J.H., and D.R. Telesca. "Potential Instrumentation Needs in the Occupational Health Area in Coal Conversion Plants." Presented at the 1980 Symposium on Instrumentation and Control for Fossil Energy Processes, Virginia Beach, Virginia, June 9-11, 1980.

Walker, J., R.K. Tanita, D.R. Telesca, and S.P. Berardinelli. "Organic Contaminants in Direct Coal Liquefaction - A Preliminary Assessment." Submitted June 9, 1980, to the American Industrial Hygiene Association Journal.

Tanita, R.K., D.R. Telesca, J. Evans, and S.P. Berardinelli. "A Study of Coal Liquefaction." Presented by D.R. Telesca at the American Industrial Hygiene Conference, May 20, 1980.

Reed, L., J. Gideon, and D.R. Telesca. "Control Technology for Coal Gasification and Liquefaction." Presented at the American Industrial Hygiene Conference, Houston, Texas, May 18-27, 1980.

Telesca, D.R., D.J. Warner, and M.A. Peterson. "Thermal Destruction of Hazardous Wastes in Existing Incinerators and Boilers. Can It Be Done Safely?" Presented at NSWMA 12th Annual Conference on Waste Technology, Memphis, Tennessee, October 18-20, 1983.

Dias, E.K., D.R. Telesca, and D.J. Warner. "A Method for Planning and Costing Hazardous Waste Site Cleanup." Presented at the 1984 National Conference on Environmental Engineering, Los Angeles, California, June 25-27, 1984.

Telesca, D.R., E.K. Dias, and W.D. Eaton. An Engineering Method for the Development of Plans and Cost Estimates for Cleanup of Hazardous Waste Site. Presented at the 1984 National Conference on Environmental Engineering, Los Angeles, California, June 25-27, 1984.

Telesca, D.R., et al. 1982. Problem Definition - Thermal Destruction of Hazardous Wastes in Navy Boilers and Incinerators.

Telesca, D.R., et al. 1983. Feasibility Study for Thermal Destruction of Liquid Hazardous Waste at the Charleston Naval Shipyard, Charleston, South Carolina.

Telesca, D.R., et al. 1984. Assessment of the State of Technology - Thermal Destruction of Hazardous Waste in Navy Boilers and Incinerators.

Telesca, D.R., et al. 1983. Technology Projection - Thermal Destruction of Hazardous Wastes in Navy Boilers and Incinerators.

Telesca, D.R., et al. 1984. Initiation Decision Report on Thermal Destruction of Low Level Hazardous Wastes in Navy Boilers and Incinerators.

Telesca, D.R. et al. 1983. Final Design Specifications. Naval Industrial Ordnance Plant Site Cleanup, Fridley, Minnesota.

Telesca, D.R., et al. 1983. Final Design Calculations and Cost Estimate. Naval Industrial Ordnance Plant Site Cleanup, Fridley, Minnesota.

Telesca, D.R., et al. 1984. Environmental Assessment: Waste Salt Disposal at the U.S. ARmy Rocky Mountain Arsenal.

Telesca, D.R., et al. 1984. Final Design and Specifications: Waste Salt Disposal at the U.S. Army Rocky Mountain Arsenal.

Telesca, D.R., et al. 1985. 60% General Design and Specifications, Hazardous Waste (Asbestos) Removal From and Demolition of White Alice Sites. Alaska Air Command.

Telesca, D.R., et al. 1985. Study of Treatment of Hazardous Wastes at Pearl Harbor Industrial Waste Treatment Plant, Hawaii.

Telesca, D.R., et al. 1985. Statement of Work for Phase IVA Remedial Action Plan. Installation Restoration Program, MacDill AFB.

Telesca, D.R., et al., 1984. Navy Assessment and Control of Installation Pollutants. Confirmation Study for Sites 1, 3, 5 and 9 at the Naval Weapons Support Center, Crane, Indiana.

Appendix B
Interviewee Information

INTERVIEWEE INFORMATION

Florida Air National Guard,
Jacksonville International Airport,
Jacksonville, Florida

Interviewee Number	Primary Duty Assignment	Years Associated with Florida ANG, Jacksonville IAP
1	Missile Maintenance	18
2	Explosives Safety	18
3	Fire Department	12
4	AGE Shop	18
5	AGE Shop	18
6	Engine Shop	18
7	Quality Control	18
8	Bulk Explosives Support	12
9	Corrosion Control	4
10	Corrosion Control	4
11	Base Supply	18
12	Vehicle Maintenance	18
13	Bulk Fuels	14
14	Civil Engineering	1
15	Bioenvironmental Engineering	1
16	Civil Engineering	10
17	Civil Engineering	1

Appendix C
Outside Agency Contact List

OUTSIDE AGENCY CONTACT LIST

1. Jacksonville International Airport Authority
   P.O. Box 18097
   Jacksonville, Florida 32229
   (904) 757-2261

2. Florida Game and Freshwater Fish Commission
   Northwest Region
   Route 7, Box 440
   Lake City, Florida 32055
   (904) 752-0353

3. Northeast Florida Regional Planning Council
   8649 Baypine Road
   Suite 110
   Jacksonville, Florida 32216
   Bruce Ford
   (904) 737-7311

4. Florida Department of Natural Resources
   3900 Commonwealth Boulevard
   Tallahassee, Florida 32399-3000
   Bruce Linton
   (904) 488-1554

5. City of Jacksonville
   Bioenvironmental Services Division
   515 West 6th Street
   Jacksonville, Florida 32206
   Gary Weiss
   (904) 630-3210

6. St. Johns River Water Management District
   P.O. Box 1429
   Palatka, Florida 32078
   Rick Levin
   (904) 328-8321

7. United States Geological Survey
   12202 Sunrise Valley Drive
   Reston, Virginia 22092

8. United States Department of Agriculture
   Soil Conservation Service
   401 S.E. First Avenue, Room 248
   Gainesville, Florida 32601

Appendix D
USAF Hazard Assessment Rating Methodology

USAF HAZARD ASSESSMENT RATING METHODOLOGY

The Department of Defense (DoD) has established a comprehensive program to identify, evaluate, and control problems associated with past disposal practices at DoD facilities. One of the actions required under this program is to:

> develop and maintain a priority listing of contaminated installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts. (Reference: DEQPPM 81-5, 11 December 1981).

Accordingly, the United States Air Force (USAF) has sought to establish a system to set priorities for taking further actions at sites based upon information gathered during the Records Search phase of its Installation Restoration Program (IRP).

PURPOSE

The purpose of the site rating model is to provide a relative ranking of sites of suspected contamination from hazardous substances. This model will assist the Air National Guard in setting priorities for follow-on site investigations.

This rating system is used only after it has been determined that (1) potential for contamination exists (hazardous wastes present in sufficient quantity), and (2) potential for migration exists. A site can be deleted from consideration for rating on either basis.

DESCRIPTION OF MODEL

Like the other hazardous waste site ranking models, the U.S. Air Force's site rating model uses a scoring system to rank sites for priority attention. However, in developing this model, the designers incorporated some special features to meet specific DoD program needs.

The model uses data readily obtained during the Records Search portion (Phase I) of the IRP. Scoring judgment and computations are easily made. In assessing the hazards at a given site, the model develops a score based on the most likely routes of contamination and the worst hazards at the site. Sites are given low scores only if there are clearly no hazards. This approach meshes well with the policy for evaluating and setting restrictions on excess DoD properties.

Site scores are developed using the appropriate ranking factors according to the method presented in the flow chart (Figure 1 of this report). The site rating form and the rating factor guideline are provided at the end of this appendix.

As with the previous model, this model considers four aspects of the hazard posed by a specific site: possible receptors of the contamination, the waste and its characteristics, the potential pathways for contamination migration, and any efforts that were made to contain the wastes resulting from a spill.

The receptors category rating is based on four rating factors: the potential for human exposure to the site, the potential for human ingestion of contaminants should underlying aquifers be polluted, the current and anticipated uses of the surrounding area, and the potential for adverse effects upon important biological resources and fragile natural settings. The potential for human exposure is evaluated on the basis of the total population within 1,000 feet of the site, and the distance between the site and the base boundary. The potential for human ingestion of contaminants is based on the distance between the site and the nearest well, the groundwater use of the uppermost aquifer, and population served by the groundwater supply within 3 miles of the site. The uses of the surrounding area are determined by the zoning within a 1-mile radius. Determination of whether or not critical environments exist within a 1-mile radius of the site predicts the potential for

adverse effects from the site upon important biological resources and fragile natural settings. Each rating factor is numerically evaluated (0-3) and increased by a multiplier. The maximum possible score is also computed. The factor score and maximum possible scores are totaled, and the receptors subscore computed as follows: receptors subscore = (100 x factor score subtotal/ maximum score subtotal).

The waste characteristics category is scored in three steps. First, a point rating is assigned based on an assessment of the waste quantity and the hazard (worst case) associated with the site. The level of confidence in the information is also factored into the assessment. Next, the score is multiplied by a waste persistence factor, which acts to reduce the score if the waste is not very persistent. Finally, the score is further modified by the physical state of the waste. Liquid wastes receive the maximum score, while scores for sludges and solids are reduced.

The pathways category rating is based on evidence of contaminant migration or an evaluation of the highest potential (worst case) for contaminant migration along one of three pathways: surface-water migration, flooding, and groundwater migration. If evidence of contaminant migration exists, the category is given a subscore of 80 to 100 points. For indirect evidence, 80 points are assigned, and for direct evidence, 100 points are assigned. If no evidence is found, the highest score among the three possible routes is used. The three pathways are evaluated and the highest score among all four of the potential scores is used.

The scores for each of the three categories are added together and normalized to a maximum possible score of 100. Then the waste management practice category is scored. Scores for sites with no containment are not reduced. Scores for sites with limited containment can be reduced by 5 percent. If a site is contained and well managed, its score can be reduced by 90 percent. The final site score is calculated by applying the waste management practices category factory to the sum of the scores for the other three categories.

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE ______________________________

LOCATION ______________________________

DATE OF OPERATION OR OCCURRENCE ______________________________

OWNER/OPERATOR ______________________________

COMMENTS/DESCRIPTION ______________________________

SITE RATED BY ______________________________

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site		4		
B. Distance to nearest well		10		
C. Land use/zoning within 1 mile radius		3		
D. Distance to installation boundary		6		
E. Critical environments within 1 mile radius of site		10		
F. Water quality of nearest surface water body		6		
G. Ground water use of uppermost aquifer		9		
H. Population served by surface water supply within 3 miles downstream of site		6		
I. Population served by ground-water supply within 3 miles of site		6		
		Subtotals	______	______

Receptors subscore (100 X factor score subtotal/maximum score subtotal) ______

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) ______
2. Confidence level (C = confirmed, S = suspected) ______
3. Hazard rating (H = high, M = medium, L = low) ______

Factor Subscore A (from 20 to 100 based on factor score matrix) ______

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

______ X ______ = ______

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

______ X ______ = ______

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore ______

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water		8		
Net precipitation		6		
Surface erosion		8		
Surface permeability		6		
Rainfall intensity		8		
		Subtotals	______	______

Subscore (100 X factor score subtotal/maximum score subtotal) ______

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding		1		

Subscore (100 X factor score/3) ______

3. Ground water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water		8		
Net precipitation		6		
Soil permeability		8		
Subsurface flows		8		
Direct access to ground water		8		
		Subtotals	______	______

Subscore (100 X factor score subtotal/maximum score subtotal) ______

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore ______

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors ______
Waste Characteristics ______
Pathways ______

Total ______ divided by 3 = ______
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

______ X ______ = $\boxed{}$

HAZARDOUS ASSESSMENT RATING METHODOLOGY GUIDELINES

I. RECEPTORS CATEGORY

Rating Factors	Rating Scale Levels: 0	1	2	3	Multiplier
A. Population within 1,000 feet (includes on-base facilities)	0	1-25	26-100	Greater than 100	4
B. Distance to nearest water well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 3,000 feet	10
C. Land Use/Zoning (within 1-mile radius)	Completely remote (zoning not applicable)	Agricultural	Commercial or Industrial	Residential	3
D. Distance to installation boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet	6
E. Critical environments (within 1-mile radius)	Not a critical environment	Natural areas	Pristine natural areas; minor wetlands; preserved areas; presence of economically important natural resources susceptible to contamination	Major habitat of an endangered or threatened species; presence of recharge area; major wetlands	10
F. Water quality/use designation of nearest surface water body	Agricultural or Industrial use	Recreation, propagation and management of fish and wildlife	Shellfish propagation and harvesting	Potable water supplies	6
G. Ground-water use of uppermost aquifer	Not used, other sources readily available	Commercial, industrial, or irrigation, very limited other water sources	Drinking water, municipal water available	Drinking water, no municipal water available; commercial, industrial, or irrigation, no other water source available	9
H. Population served by surface water supplies within 3 miles downstream of site	0	1-15	51-1,000	Greater than 1,000	6
I. Population served by aquifer supplies within 3 miles of site	0	1-50	51-1,000	Greater than 1,000	6

II. WASTE CHARACTERISTICS

A-1 Hazardous Waste Quantity

S = Small quantity (<5 tons or 20 drums of liquid)
M = Moderate quantity (5 to 20 tons or 21 to 85 drums of liquid)
L = Large quantity (>20 tons or 85 drums of liquid)

A-2 Confidence Level of Information

C = Confirmed confidence level (minimum criteria below)

- o Verbal reports from interviewer (at least 2) or written information from the records
- o Knowledge of types and quantities of wastes generated by shops and other areas on base

S = Suspected confidence level

- o No verbal reports or conflicting verbal reports and no written information from the records
- o Logic based on a knowledge of the types and quantities of hazardous wastes generated at the base, and a history of past waste disposal practices indicate that these wastes were disposed of at a site

A-3 Hazard Rating

Rating Factors	Rating Scale Levels 0	1	2	3
Toxicity	Sax's Level 0	Sax's Level 1	Sax's Level 2	Sax's Level 3
Ignitability	Flash point greater than 200°F	Flash point at 140°F to 200°F	Flash point at 80°F to 140°F	Flash point less than 80°F
Radioactivity	At or below background levels	1 to 3 times background levels	3 to 5 times background levels	Over 5 times background levels

Use the highest individual rating based on toxicity, ignitability and radioactivity and determine the hazard rating.

Hazard Rating	Points
High (H)	3
Medium (M)	2
Low (L)	1

II. WASTE CHARACTERISTICS--Continued

Waste Characteristics Matrix

Point Rating	Hazardous Waste Quantity	Confidence Level of Information	Hazard Rating
100	L	C	H
80	L	C	M
	M	C	H
70	L	S	H
60	S	C	H
	M	C	M
50	L	S	M
	L	C	L
	M	S	H
	S	C	M
40	S	S	H
	M	S	M
	M	C	L
	L	S	L
30	S	C	L
	M	S	L
	S	S	M
20	S	S	L

Notes:
For a site with more than one hazardous waste, the waste quantities may be added using the following rules:
Confidence Level
- o Confirmed confidence levels (C) can be added.
- o Suspected confidence levels (S) can be added.
- o Confirmed confidence levels cannot be added with suspected confidence levels.

Waste Hazard Rating
- o Wastes with the same hazard rating can be added.
- o Wastes with different hazard ratings can only be added in a downgrade mode, e.g., MCM + SCH = LCM if the total quantity is greater than 20 tons.

Example: Several wastes may be present at a site, each having an MCM designation (60 points). By adding the quantities of each waste, the designation may change to LCM (80 points). In this case, the correct point rating for the waste is 80.

B. Persistence Multiplier for Point Rating

Persistence Criteria	Multiply Point Rating From Part A by the Following
Metals, polycyclic compounds, and halogenated hydrocarbons	1.0
Substituted and other ring compounds	0.9
Straight chain hydrocarbons	0.8
Easily biodegradable compounds	0.4

C. Physical State Multiplier

Physical State	Multiply Point Total From Parts A and B by the Following
Liquid	1.0
Sludge	0.75
Solid	0.50

III. PATHWAYS CATEGORY

A. Evidence of Contamination

Direct evidence is obtained from laboratory analyses of hazardous contaminants present above natural background levels in surface water, ground water, or air. Evidence should confirm that the source of contamination is the site being evaluated.

Indirect evidence might be from visual observation (i.e., leachate), vegetation stress, sludge deposits, presence of taste and odors in drinking water, or reported discharges that cannot be directly confirmed as resulting from the site, but the site is greatly suspected of being a source of contamination.

B-1 Potential for Surface Water Contamination

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
Distance to nearest surface water (includes drainage ditches and storm sewers)	Greater than 1 mile	2,001 feet to 1 mile	501 feet to 2,000 feet	0 to 500 feet	8
Net precipitation	Less than -10 inches	-10 to +5 inches	+5 to +20 inches	Greater than +20 inches	6
Surface erosion	None	Slight	Moderate	Severe	8
Surface permeability	0% to 15% clay ($>10^{-2}$ cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	Greater than 50% clay ($>10^{-6}$ cm/sec)	6
Rainfall intensity based on 1-year 24-hour rainfall	<1.0 inch	1.0 to 2.0 inches	2.1 to 3.0 inches	>3.0 inches	8
(Thunderstorms)	0-5 0	6-35 30	36-49 60	>50 100	

B-2 Potential for Flooding

Floodplain	Beyond 100-year floodplain	In 100-year floodplain	In 10-year floodplain	Floods annually	1

B-3 Potential for Ground-Water Contamination

Depth to ground water	Greater than 500 feet	50 to 500 feet	11 to 50 feet	0 to 10 feet	8
Net precipitation	Less than -10 inches	-10 to +5 inches	+5 to + 20 inches	Greater than +20 inches	6
Soil permeability	Greater than 50% clay ($>10^{-6}$ cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	0% to 15% clay ($<10^{-2}$ cm/sec)	8

B-3 Potential for Ground-Water Contamination--Continued

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
Subsurface flows	Bottom of site greater than 5 feet above high ground-water level	Bottom of site occasionally submerged	Bottom of site frequently submerged	Bottom of site located below mean ground-water level	8
Direct access to ground water (through faults, fractures, faulty well casings, subsidence, fissures, etc.)	No evidence of risk	Low risk	Moderate risk	High risk	8

IV. WASTE MANAGEMENT PRACTICES CATEGORY

A. This category adjusts the total risk as determined from the receptors, pathways, and waste characteristics categories for waste management practices and engineering controls designed to reduce this risk. The total risk is determined by first averaging the receptors, pathways, and waste characteristics subscores.

B. Waste Management Practices Factor

The following multipliers are then applied to the total risk points (from A):

Waste Management Practice	Multiplier
No containment	1.0
Limited containment	0.95
Fully contained and in full compliance	0.10

Guidelines for fully contained:

Landfills:

- o Clay cap or other impermeable cover
- o Leachate collection system
- o Liners in good condition
- o Adequate monitoring wells

Surface Impoundments:

- o Liners in good condition
- o Sound dikes and adequate freeboard
- o Adequate monitoring wells

Spills:

- o Quick spill cleanup action taken
- o Contaminated soil removed
- o Soil and/or water samples confirm total cleanup of the spill

Fire Protection Training Areas:

- o Concrete surface and berms
- o Oil/water separator for pretreatment of runoff
- o Effluent from oil/water separator to treatment plant

General Note: If data are not available or known to be complete the factor ratings under items I-A through I, III-B-1, or III-6-3, then leave blank for calculation of factor score and maximum possible score.

CNR122

Appendix E
Site Hazardous Assessment Rating Forms

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE Site No.1 - OWS InletsAlong Aircraft Parking Apron

LOCATION Downgradient (north) End of Parking Apron

DATE OF OPERATION OR OCCURRENCE 1980 -1986 (est.)

OWNER/OPERATOR 125th FIG, Florida Air National Guard, Jacksonville IAP

COMMENTS/DESCRIPTION

SITE RATED BY Hazardous Materials Technical Center

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	2	10	20	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to installation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	2	10	20	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	3	6	18	[illegible]
		Subtotals	127	[illegible]

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 71

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) M
2. Confidence level (C - confirmed, S - suspected) C
3. Hazard rating (H - high, M - medium, L - low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 80

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

80 x 0.9 = 72

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

72 x 1.0 = 72

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	1	8	8	24
Surface permeability	1	6	6	18
Rainfall intensity	3	8	24	24
		Subtotals	74	108

Subscore (100 X factor score subtotal/maximum score subtotal) 69

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
2. Flooding	0	1	0	3

Subscore (100 X factor score/3) 0

3. Ground water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	1	8	8	24
Direct access to ground water	0	8	0	24
		Subtotals	60	114

Subscore (100 X factor score subtotal/maximum score subtotal) 53

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 69

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	71
Waste Characteristics	72
Pathways	69
Total 212 divided by 3 =	71 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

71 x 1.0 = $\boxed{71}$

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE Site No. 3 - Fire Training Area

LOCATION 800 Ft. East of Old Hush House

DATE OF OPERATION OR OCCURRENCE 1968 - 1984

OWNER/OPERATOR 125th FIG, Florida Air National Guard, Jacksonville IAP

COMMENTS/DESCRIPTION

SITE RATED BY Hazardous Materials Technical Center

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	2	10	20	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to installation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	2	10	20	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	3	6	18	18
		Subtotals	127	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 71

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) M
2. Confidence level (C - confirmed, S - suspected) C
3. Hazard rating (H - high, M - medium, L - low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 80

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

80 x 1.0 = 80

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

80 x 1.0 = 80

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	1	8	8	24
Surface permeability	1	6	6	18
Rainfall intensity	3	8	24	24
Subtotals			74	108

Subscore (100 X factor score subtotal/maximum score subtotal) 69

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding	0	1	0	3

Subscore (100 X factor score/3) 0

3. Ground water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	1	8	8	24
Direct access to ground water	0	8	0	24
Subtotals			60	114

Subscore (100 X factor score subtotal/maximum score subtotal) 53

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 69

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors 71
Waste Characteristics 80
Pathways 69

Total 220 divided by 3 = 73
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

73 x 1.0 = $\boxed{73}$

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE Site No. 4 - OWS at the Hush House (Bldg 25)

LOCATION Adjacent to Building 25

DATE OF OPERATION OR OCCURRENCE 1980 to Present

OWNER/OPERATOR 125th FIG, Florida Air National Guard, Jacksonville IAP

COMMENTS/DESCRIPTION

SITE RATED BY Hazardous Materials Technical Center

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	2	10	20	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to installation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	2	10	20	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	3	6	18	18
		Subtotals	127	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 71

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) S
2. Confidence level (C - confirmed, S - suspected) C
3. Hazard rating (H - high, M - medium, L - low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 60

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

60 x 0.9 = 54

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

54 x 1.0 = 54

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 80

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	1	8	8	24
Surface permeability	1	6	6	18
Rainfall intensity	3	8	24	24
		Subtotals	74	108

Subscore (100 X factor score subtotal/maximum score subtotal) 69

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
2. Flooding	0	1	0	3

Subscore (100 X factor score/3) 0

3. Ground water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	1	8	8	24
Direct access to ground water	0	8	0	24
		Subtotals	60	114

Subscore (100 X factor score subtotal/maximum score subtotal) 53

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 80

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	71
Waste Characteristics	54
Pathways	80

Total 205 divided by 3 = 68
Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

68 x 1.0 = 68

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE Site No. 7 - Trim Pad for Aircraft Run-up

LOCATION 0.3 mile East of Hush House

DATE OF OPERATION OR OCCURRENCE 1974 - 1986

OWNER/OPERATOR 125th FIG, Florida Air National Guard, Jacksonville IAP

COMMENTS/DESCRIPTION

SITE RATED BY Hazardous Materials Technical Center

I. RECEPTORS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site	3	4	12	12
B. Distance to nearest well	2	10	20	30
C. Land use/zoning within 1 mile radius	2	3	6	9
D. Distance to installation boundary	3	6	18	18
E. Critical environments within 1 mile radius of site	2	10	20	30
F. Water quality of nearest surface water body	1	6	6	18
G. Ground water use of uppermost aquifer	2	9	18	27
H. Population served by surface water supply within 3 miles downstream of site	0	6	0	18
I. Population served by ground-water supply within 3 miles of site	3	6	18	18
		Subtotals	127	180

Receptors subscore (100 X factor score subtotal/maximum score subtotal) 71

II. WASTE CHARACTERISTICS

A. Select the factor score based on the estimated quantity, the degree of hazard, and the confidence level of the information.

1. Waste quantity (S = small, M = medium, L = large) L
2. Confidence level (C - confirmed, S - suspected) C
3. Hazard rating (H - high, M - medium, L - low) H

Factor Subscore A (from 20 to 100 based on factor score matrix) 100

B. Apply persistence factor
Factor Subscore A X Persistence Factor = Subscore B

100 x 0.9 = 90

C. Apply physical state multiplier

Subscore B X Physical State Multiplier = Waste Characteristics Subscore

90 x 1.0 = 90

III. PATHWAYS

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.

Subscore 0

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Distance to nearest surface water	3	8	24	24
Net precipitation	2	6	12	18
Surface erosion	1	8	8	24
Surface permeability	1	6	6	18
Rainfall intensity	3	8	24	24
		Subtotals	74	108

Subscore (100 X factor score subtotal/maximum score subtotal) 69

2. Flooding

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Flooding	0	1	0	3

Subscore (100 X factor score/3) 0

3. Ground water migration

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
Depth to ground water	3	8	24	24
Net precipitation	2	6	12	18
Soil permeability	2	8	16	24
Subsurface flows	1	8	8	24
Direct access to ground water	0	8	0	24
		Subtotals	60	114

Subscore (100 X factor score subtotal/maximum score subtotal) 53

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 69

IV. WASTE MANAGEMENT PRACTICES

A. Average the three subscores for receptors, waste characteristics, and pathways.

Receptors	71
Waste Characteristics	90
Pathways	69

Total 230 divided by 3 = 77 Gross Total Score

B. Apply factor for waste containment from waste management practices

Gross Total Score X Waste Management Practices Factor = Final Score

77 x 1.0 = 77

125th TACTICAL FIGHTER GROUP
FLORIDA AIR NATIONAL GUARD
JACKSONVILLE INTERNATIONAL AIRPORT
JACKSONVILLE, FLORIDA

USAF Hazard Assessment Rating Methodology
Rating Factor Criteria

The following is a summary and explanation of the rating factor criteria used to score the Base sites under HARM. The majority of the factors in the receptors and pathway categories are the same for each of the rated sites and are therefore stated only once. In those instances where a rating factor varies according to a specific site, the factor is addressed separately for each of the respective sites.

I. RECEPTORS

A. Population within 1,000 feet of site. Factor Rating 3 - Accounting for the Base population, there are at least 1,000 persons on or within 1,000 feet of the Base.

B. Distance to nearest well. Factor Rating 2 - According to St. Johns River Water Management District personnel, private wells are used by local residences within 0.5 mile of the Base.

C. Land use/zoning (within one mile radius). Factor Rating 2 - The majority of the land surrounding the airport is agricultural land; however, there are also small areas of commercial/industrial development.

D. Distance to installation boundary. Factor Rating 3 - All sites identified on the Base are within 1,000 feet of the boundary.

E. Critical environments (within 1 mile radius of site). Factor Rating 2 - Minor wetland areas are present adjacent to the Base.

F. Water quality/use designation of nearest surface water body. Factor Rating 1 - Surface waters in the vicinity of the Base are suitable for recreational fishing and wildlife habitats.

G. Groundwater use of uppermost aquifer. Factor Rating 2 - The uppermost aquifer at the Base is utilized as a drinking water source by some local residents.

H. <u>Population served by surface water supplies within 3 miles downstream of the site</u>. Factor Rating 0 - Surface water areas within three miles of the Base are not used as drinking water sources.

I. <u>Population served by aquifer supplies within 3 miles of the site</u>. Factor Rating 3 - Accounting for the JIAP wells and numerous wells used by hotels and local residents within 3 miles of the site, the total population served by aquifer suppliers exceeds 1,000 persons. However, it should be noted that the majority of these persons are served by confined aquifers, which are not considered to be significantly susceptible to contamination from surface sources.

II. WASTE CHARACTERISTICS

<u>Site No. 1</u>:

- A-1: Hazardous Waste Quantity - Factor Rating M. It is estimated that between one and four thousand gallons of JP-4 were released at this site.
- A-2: Confidence Level - Factor Rating C. Interviewees confirmed that spills occurring on the aircraft parking apron were drained or washed to this site.
- A-3: Hazard Rating - Factor Rating H. The hazard rating at this site is based on JP-4 toxicity. JP-4 has a Sax toxicity of 3, which corresponds to a HARM hazard rating of 3.

B. <u>Persistence Multiplier</u> - 0.9:

JP-4 falls within the category of substituted and other ring compounds.

<u>Site No. 3</u>

- A-1: Hazardous Waste Quantity - Factor Rating 2. It is estimated that up to 6,400 gallons of JP-4 and other flammables were released at each of the FTA's and that approximately 70% was burned, leaving a total of 2,000 gallons at this site.
- A-2: Confidence Level - Factor Rating C. Numerous interviewees were able confirm that wastes were routinely dumped at this site.
- A-3: Hazard Rating - Factor Rating H. The Hazard rating at this site was based upon reports that some solvents were released here, in addition to JP-4. It is likely that these solvents included halogenated solvents which have a Sax rating of 3.

- B-1: Persistence Multiplier - 1.0. Halogenated solvents fall within the category of halogenated hydrocarbons, which corresponds to a persistence multiplier of 1.0.

Site No. 4

- A-1: Hazardous Waste Quantity - Factor Rating S. It is estimated that the quantity of waste released at this site approaches, but do not exceed 1,000 gallons.

- A-2: Confidence Level - Factor Rating C. There is visible evidence of leakage at this site and interviewee confirmation of past leakage.

- A-3: Hazard Rating - Factor Rating H. The hazard rating at this site was based on JP-4 toxicity. JP-4 has a Sax toxicity rating of 3, which corresponds to a HARM rating of 3.

B. Persistence Multiplier - 0.9:

JP-4 falls within the category of substituted and other ring compounds.

Site No. 7

- A-1: Hazardous Waste Quantity - Factor Rating L. It is estimated that routine spillage from engine run-up activities at this site have resulted in a total release of 21,000 to 30,000 gallons of JP-4.

- A-2: Confidence Level - Factor Rating C. Interviewees confirmed that JP-4 was frequently released at this site.

- A-3: Hazard Rating - Factor Rating H. Hazard rating at this site was based upon JP-4 toxicity. JP-4 has a Sax rating of 3, which corresponds to a HARM rating of 3.

B. Persistence Multiplier - 0.9:

JP-4 falls within the category of substituted and other ring compounds.

C. Physical State Multiplier: Site Nos. 1 through 5 - Factor Rating 1.0. The waste released at each of the HARM scored sites was in a liquid state.

III. PATHWAYS CATEGORY

A. Evidence of Contamination.

Site No. 1: 0 - No Evidence. There is no direct or indirect evidence that contaminants are migrating from this site.

Site No 3: 0 - No Evidence. There is no direct or indirect evidence that contaminants are migrating from this site.

Site No. 4: Factor Rating 80 - Indirect Evidence. There is visual evidence of contaminant migration from this site. POL contaminated water from an OWS at this site is away from the Base in a local surface stream.

Site No. 7: Factor Rating 0 - No Evidence. There is no direct or indirect evidence that contaminants are migrating from this site.

B-1: Potential for Surface Water Contamination.

- Distance to nearest surface water (includes drainage ditches and storm sewers): Factor Rating 3. Each of the identified sites on the Base are within 500 feet of surface water.

- Net precipitation: Factor Rating 2. Net precipitation at the Base is calculated to be 8.47 inches per year.

- Soil erosion: Factor Rating 1. There was no visible evidence of significant erosion at the Base and the Soil Conservation Service does not classify the soil association covering the Base within an erosion hazard.

- Surface permeability: Factor Rating 1. Soils at the Base are rather sandy and have a permeability rate of 10^{-2} to 10^{-4} cm/sec.

- Rainfall intensity based on 1-year, 24-hour rainfall: Factor Rating 3. The 1-year, 24-hour rainfall value is 4 inches.

B-2: Potential for Flooding - Factor Rating 0. According to Northeast Florida Regional Planning Council flood records, the Base does not lie with in a 100 year floodplain.

B-3: Potential for Groundwater Contamination.

- Depth to groundwater: Factor Rating 3. Base records indicate a shallow water table in some places, within 2.5 feet of the land surface.

- Net precipitation: Factor Rating 2. See B-2.

- Soil permeability: Factor Rating 2. See B-2.

- Subsurface flows: Factor Rating 1. There is no evidence to suggest that the bottom of any of the Base sites is more than occasionally submerged beneath the water table. Site No. 4, the Hush House OWS, may be submerged if wastes are discharging at the bottom of the separator; however, this cannot be determined at this point.

- o <u>Direct access to groundwater</u>: Factor Rating 0. There is no evidence that contaminants at these sites have direct access to groundwater.

IV. <u>WASTE MANAGEMENT PRACTICES CATEGORY</u>

Waste Management Factor Multiplier: 1.0. There are no forms of contaminant containment at the HARM scored sites.

APPENDIX F

OEHL Test Results

LABORATORY ANALYSIS REPORT AND RECORD (General)	DATE 21 OCT 1985
TO.	FROM USAF OEHL/SA Brooks AFB TX 78235550[illegible]
SAMPLE IDENTITY Water	DATE 15 OCT 1985
SAMPLE FROM	LAB CONTROL NR

TEST FOR
Volatile Aromatics

Methodology: EPA 602

OEHL NO:	72865				Detection Limit	
BASE NO:	6N850027				ND	T
Benzene	186				1.0	
Chlorobenzene	7				1.0	
1,2-Dichlorobenzene	ND				2.0	
1,3-Dichlorobenzene	77				2.0	
1,4-Dichlorobenzene	123				2.0	
Ethylbenzene	ND				1.0	
Toluene	24				1.0	

Results in micrograms per liter.

ND-None Detected. Less than the detection limit.
TRACE-Present but less than the quantitative limit.
DATE ANALYZED: 17 OCT 1985

Edward J. Brown

21 OCT 1985

REQUESTING AGENCY (Mailing Address)
125 USAF Clinic /SGPB
P.O. Box 18018
Jacksonville IAP, FL
32229-5300

ANNA WILLIS
Technician

2216

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	72812 00005	GN850027 00029

SAMPLE COLLECTION INFORMATION

5. DATE RECEIVED BY LAB	15 05.85
6. DATE ANALYSIS COMPLETED	24 05.85
7. SITE DESCRIPTION	
8. SITE LOCATION NO	
9. FLOWRATE AT SITE 00058 GAL/MIN	
10. WEATHER 00041	
11. COLLECTION DATE/PERIOD	
12. COLLECTORS NAME	
13. SAMPLING TECHNIQUE	
14. PHONE NUMBER	
15. REASON FOR SAMPLE SUBMISSION	NPDES #

ON-SITE ANALYTICAL RESULTS

16. WATER TEMP 00010 °C	17. PH 00400 UNITS	18. DISS O_2 00300 MG/L

19. RESULTS OF OTHER ON-SITE ANALYSES

ANALYSES REQUESTED AND RESULTS

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	.
Total Organic CARBON as C	00680	.
		.

PRESERVATION GROUP B

PARAMETER	TOTAL	MG/L
OIL & GREASE FREON-IR Method	00560	.

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	.
NITRATE as N Cd Reduct. Method	00620	.
NITRITE as N	00615	.
TOTAL KJELDAHL NITROGEN as N	00625	.
PHOSPHORUS Ortho PO4 as P	70507	.
PHOSPHORUS as P	00665	.

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	.
CYANIDE Free, Amenable to Cl_2	00722	.

PRESERVATION GROUP E

PARAMETER	TOTAL	µG/L
PHENOLS	32730	.
		.

PRESERVATION GROUP F (295)

PARAMETER	DISS	TOTAL	µG/L
ARSENIC	01000	01002	<10 .
BARIUM	01005	01007	<200 .
CADMIUM	01025	01027	<10 .
CHROMIUM	01030	01034	141 .
CHROMIUM Hexavalent		01032	<50 .
COPPER	01040	01042	.
IRON	01046	01045	.
LEAD	01049	01051	<20 .
MANGANESE	01056	01055	.
MERCURY	71890	71900	<1 .
NICKEL	01065	01067	.
SELENIUM	01145	01147	<10 .
SILVER	01075	01077	<10 .
ZINC	01090	01092	.
CALCIUM as Ca	00915	00916	. mg/l
MAGNESIUM as Mg	00925	00927	. mg/l
POTASSIUM	00935	00937	. mg/l
SODIUM	00930	00929	. mg/l
Antimony			<10
Beryllium			<10

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	. µg/l
BORON, Dissolved	01020	. µg/l
CHLORIDE	00940	.
COLOR	00080	Units
FLUORIDE	00951	.
Residue Filterable (TDS)	00515	.
Residue Non Filt (SS)	00530	.
Residue	00500	.
Residue Volatile	00505	.
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	.
SURFACTANTS MBAS as LAS	38260	.
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

1. ORGANIZATION REQUESTING ANALYSIS

Florida ANG

CHEMIST

EH, WH, [illegible]

REVIEWED BY

APPROVED BY

[signature]

LABORATORY ANALYSIS REPORT AND RECORD (General)

DATE: 18 NOV 1985

TO:

FROM: USAF OEHL/SA
BROOKS AFB TX 78235-5501

DATE RECEIVED: 15 OCT 1985

IDENTITY

LAB CONTROL NR

SAMPLE FROM

TEST FOR
Volatile Halocarbons

Methodology: EPA Method 601

OEHL NO:	72813					DET. LIMIT
BASE NO:	GN850027					
Bromodichloromethane	ND					0.1
Bromoform						0.2
Bromomethane						1.0
Carbon Tetrachloride						0.1
Chlorobenzene						0.2
Chloroethane						0.5
2-Chloroethylvinyl ether						0.1
Chloroform						0.1
Chloromethane						0.1
Dibromochloromethane						0.1
1,2-Dichlorobenzene						0.2
1,3-Dichlorobenzene						0.2
1,4-Dichlorobenzene						0.2
Dichlorodifluoromethane						0.1
1-Dichloroethane						0.2
-Dichloroethane						0.2
,1-Dichloroethene						0.1
trans-1,2-Dichloroethene						0.1
1,2-Dichloropropane						0.1
cis-1,3-Dichloropropene						0.2
trans-1,3-Dichloropropene						0.2
Methylene Chloride						0.2
1,1,2,2-Tetrachloroethane						0.1
Tetrachloroethylene	118.6					0.1
1,1,1-Trichloroethane	111.4					0.1
1,1,2-Trichloroethane	ND					0.1
Trichloroethylene	33.5					0.1
Trichlorofluoromethane	ND					0.1
Vinyl Chloride	ND					0.2

Results in Micrograms per Liter

DATE ANALYZED: 18 OCT 1985

Edward J. Brown

18 NOV 1985

REQUESTING AGENCY (Mailing Address)
?25 USAF CLINIC/SGPB
P.O. BOX 18018
JAX IAP
FL 32229-5000

ND-NONE DETECTED, LESS THAN THE DETECTION LIMIT.

TRACE-PRESENT BUT LESS THAN THE QUANTITATIVE LIMIT
TRACE = 2 times Detection Limit.

ERIC A. BANKS, Capt, USAF
Chemist

LMED

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